ABSTRACT

Title of Thesis:	VERTICAL URBANISM
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Oxford defines culture as ideas, customs, and social behaviors of a particular people or society; the attitudes and behavioral characteristics of a certain social group. For the most part this is good; that is the culture you identify with can give one, but not always, identity, tradition, beliefs, etc. Since birth, these sets of ideas permeate through interactions, whether that is with people, with objects, or with society's concepts. Thus, culture is *adopted* and a world view is *formed*.

Space, as a comparison with the previous depiction, is the state of architecture, or lack thereof, at birth; pure and blank. Humanity, as survival necessitated, shaped, limited, and defined space while simultaneously imbuing meaning that *characterize* it; the cave has one opening, the tipi has a center hearth, the church has a spire. These arrangements, so culturally ingrained, start to visually define each building type respectively. Architectural, as a result, is then experienced inattentively; instead of being contemplated it is scanned, instead of absorbed it is passed. This thesis, in an attempt to jar this process, takes the unique opportunities of verticality to explore and challenge the conventions of the model type. Not to endanger the cultural lens, but to engage it and make it apparent to the user.

VERTICAL URBANISM

by

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
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Advisory Committee:
Professor David Cronrath, Chair
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PREFACE

"Look at everything as though you are seeing it for the first time, with eyes of a child, fresh with wonder"

– Joseph Cornell

DEDICATION

To my mother for being my constant support

everything I am you helped me to be

ACKNOWLEDGEMENTS

A dedicated mentor and an amazing chair

Thank you Professor Cronrath

The culmination of my education wouldn't have been the same without your guidance

To all my friends who helped through my final year

Thank You:

Class of 2017

Lori Gjoni

Robert Grooms

Marshall Hamilton

Chris Reyes

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CHAPTER 1: CULTURE AS A CONSTRUCT

Culture is a social construct. Not to negate its importance or reduce its significance, but much like government, education, and technology, culture is not innate. Rather it is a created, taught, and learned *tool*; a set of criteria or a series of lenses to be used to identify ourselves and understand our environment. Clifford Geertz, an American anthropologist, believes culture "denotes an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life"[1]. Space is not separate from culture but is demarcated and used by culture and ultimately follows the same rule as the whole; it is a social construct.

SOCIAL CONSTRUCT

> *[Man] can adapt himself somehow to anything his imagination can cope with; but he cannot deal with Chaos. Because his characteristic function and highest asset is conception, his greatest fright is to meet what he cannot construe – the "uncanny," as it is popularly called. It need not be a new object; we do meet new things, and "understand" them promptly, if tentatively, by the nearest analogy, when our minds are functioning freely; but under mental stress even perfectly familiar things may become suddenly disorganized and give us the horrors, therefore our most important assets are always the symbols of our general orientation in nature, on the earth, in society, and in what we are doing*[2]

An American born artist known for using the Surrealist technique of unexpected juxtaposition, Joseph Cornell exploits humanities uncanny necessity to make order out of perceived chaos with his poetic theaters, or more commonly known, shadow boxes. Victorian bric-a-brac, old photographs, dime-trinkets, among others were found and collected by him. These artifacts, mediums to be used in his creations, disparate in nature are composed in a frame and because

[1] Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, ©1973), 89.
[2] Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, ©1973), 99.

of their delimitation, engage the imagination and invite a narrative; a feather to evoke the flight of a bird, a seashell to suggest the ocean, and a white dowel, an emblem of all of architecture[3]. Space, devoid of the constraints provided by culture, is perceived similarly; disordered, confusing, and chaotic. It is unforgivingly endless and limitlessly powerful. In an effort to understand space, humanity learned how to manipulate natural objects to order space; man became able to create shelter by juxtaposing objects to create walls and a roof and simultaneously was able to assign meaning to the arrangement of space and use the space to communicate values and beliefs. The primitive hut was the result; but even more significant, a people learned to create space in their image. Architecture became the tool to combat the uncanny and in its effort, helped develop a lens by which one can "see" and understand his surroundings.

PERSPECTIVE LENS

> *Sacred symbols function to synthesize a people's ethos – the tone, character, and quality of their life, its moral and aesthetic style – and mood – and their world view – the picture they have of the way things in sheer actuality are, their most comprehensive ideas of order*[4]

A lens, by which I don't mean a transparent, corrective glass but otherwise functions in a similar capacity, is the tool used by humanity to understand the environment in which it interacts. Introduced at birth and nurtured through adulthood, one's cultural lens is the single, most important instrument through which the world is viewed. Unlike the myriad of tools by which man depends to perform tasks, it is difficult, if not impossible, to disable it. The result is the inability to perceive any object, any idea, any interaction without initially engaging with that lens. Objectivity, the ability to stay true outside of one's bias, is therefore a myth. Not to imply it is a

[3] Kynaston McShine and Dawn Ades, eds., *Joseph Cornell* (New York: Museum of Modern Art, ©1980), 43.
[4] Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, ©1973), 90.

fallacy or an illusion; but like all myths, it is a constructed ideal that is, outside the realms of empirical science, impossibly sought after. One has to assume then if objectivity doesn't exist and the world is viewed through a collectively constructed lens that we, as a people, use to make sense out of the chaos that exists outside of us, then there is no intrinsic value in any object of man's environment. Instead, man himself puts that value on the object; further emphasizing things are, for each person, the way they conceive them to be. Because culture denotes the ideas, customs, social behaviors of a people or society, this particular way of seeing the world is passed down through posterity. So engrained in the upbringing that it is taken to be reality, the way it naturally is and has always been; creating a *model* of how the world is and should always be.

CONCEPT OF MODEL

> *Culture patterns have an intrinsic double aspect: they give meaning, that is, objective conceptual form, to social and psychological reality both by shaping themselves to it and by shaping it to themselves*[5]

A model is sets of symbols whose relations to one another mimic relations among entities by paralleling, imitating, or simulating them[6]. There are two, distinct aspects of a model; a model "of" and a model "for". For clarification, take for example the workings of a dam. By developing a theory of hydraulics coupled with the construction of flow charts, humanity was able to express the processes of a dam in a manner that is apprehensible; man made model that *represents* reality. Consequently that model becomes a doctrine, a set of guidelines enabling the building of further dams; it becomes a model *for* reality – we define as the "real" the processes that we are able to model. Heidegger pointed this out in his essay "The Question of Technology." Heidegger

[5] Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, ©1973), 94
[6] Kenneth J W. Craik, *The Nature of Explanation* (Cambridge: Cambridge University Press, 1967), 1.

describes how our understanding of technology becomes the model through which we conceive of nature and reality. Nature and reality do not exist as meaningful constructs outside of our conception of technology. Thus we use technologies to understand nature and reality and in turn that conception shapes our technology. A contemporary example is thinking that the computer is a model for the brain. The brain really does not function like a computer, it is not a series of switches linked by a circuit board, but the analogous model does help us conceive of biological functions and provides insights into brain related therapies.

Culture is unique; it's patterns have an "intrinsic double aspect: they give meaning, that is, objective conceptual form, to social psychological reality by shaping themselves to it and by shaping it to themselves"[7]. The critique presented by this thesis is the model "of" scenario, as it pertains to culture, is created at the initial interaction between the environmental phenomena and the individual. Solidifying it as a fact, or natural state, and making it difficult to change even if the initial reasoning fails to apply. Man's environment, as a result, is exposed to the same repetitive creations based of that initial model. The neo-Gothic churches that blanket New York are a prime example. Umberto Eco, an Italian Semiotician, reflects on some of the initial connotations of forms that preceded and catalyzed the Gothic style; mysticism created by the contrast of light streaming through windows and emphasis vertically to signify souls journey toward God. In modern Manhattan however, with skyscrapers hemming at all sides, these churches should be all but indistinguishable. That is not the case. Rather, the engrained and unwavering cultural lens and its strong association with the initial model keep it relevant "precisely because they are 'read' on the basis of codes that permit one to recognize them as

[7] Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, ©1973), 95-96

distinctively vertical in spite of the new formal context"[8]. The danger lies in the strength of the association of the form with its connotation. If for example, man is only able to accept a church with forms reminiscent of the Gothic style, it becomes impossible to interpret a church in any other way. The ability to adapt to new information or reinterpret old ones will always be met with hostility because one's very culture, the instrument by which one views the world, is threatened.

PROTEAN METHOD

> *These would be protean and open objects, implying, with changes in the rhetorical apparatus constituted by them, a restructuring of the ideological apparatus, or with changes in the way they are used, change in ways of thinking, in how the forms are seen in the broadest context of human activity*[9]

How can individuals, as true captains of their respective cultures, take into account the realities of the environment, without the accustomed lens, to deform and reform their culture in order to preserve its relevance in its current context? Is humanity doomed to wallow in the ideas, beliefs, and ideology of times past? If someone were to take the mantle, perceiving the dangers, attempt to transform the current social structure, what would be the procedure? Eco believes there are three possible avenues in which to proceed. First, one could thoroughly integrate within the existing reigning cultural system; resolute to meet the expectations of the social body with no intention of upsetting it. Second, one could decide to dispense with the normal convention and introduce a new system; abandoning the previous social structure at the risk of being completely rejected. And third, one could undertake the creation of a system that would be new while intending to answer to the basic, familiar code[10]. This, however, can be extremely difficult to

[8] Neil Leach, ed., *Rethinking Architecture: A Reader in Cultural Theory* (New York: Routledge, 1997), 137.
[9] Neil Leach, ed., *Rethinking Architecture: A Reader in Cultural Theory* (New York: Routledge, 1997), 140.
[10] Neil Leach, ed., *Rethinking Architecture: A Reader in Cultural Theory* (New York: Routledge, 1997), 145.

accomplish. One will have to determine the new systems of functions that should be promoted and know how they can be linked to society's basic, existing code before attempting to introduce the new cultural systems. This method, referred to as protean, has the ability to not only shape future cultural patterns but can also, depending on what the current context maybe, adapt it frequently and continuously.

CHAPTER 2: DEVELOPMENT OF THE HIGH-RISE

The practice of architecture, and the built environment it is responsible for, cannot be thought of as an isolated entity from the human understanding of environment. It is linked to its cultural and symbolic contexts. Therefore, an architect is not simply a builder, relegated to construction, nor an artist even though the profession requires the production of representations, rather an architect is both and more; a semiotician, an anthropologist, a sociologist, engineer and a politician at the same time. The exploration of the protean method is not exclusively reserved to the field of architecture; it doesn't seem, however, an adverse place to start. The high-rise, a consequence of social, economic, and technological facets of the 19th century, is an suitable tool by which to test the hypothesis.

A NEW FRONTIER

> *"More than 150 years ago, cities looked very different from the way they look today. The buildings that housed people and their business were rarely over the height of a flagpole. Urban landscapes tended to be flat and uniform in pattern, apart from monuments, temples, and town halls; and cathedrals) adorned with domes, spires, or towers) which towered above everything else in a city or town; they were visible from miles away"*[11]

The high-rise building was an initial response to rapid population increase due to industrialization of the 19th century. Industrialization in the United States attracted a mass of people northward, particularly New York, resulting in a scarcity of space which caused arable lands to be expended for development. The high-rise, a multiplying of the property in a vertical direction, was able to house more people on a slice of land and change the trajectory of expansion from horizontal to vertical. It was not the need for living quarters however, that catalyzed the inception of the high-

[11] *High-Rise Security and Fire Life Safety* (utterworth-Heinemann: B, 2003), 4, accessed January 18, 2017, http://public.eblib.com/choice/publicfullrecord.aspx?p=294611.

rise building. As functions of production, manufacturing, warehousing, transportation, and distribution of foods and raw materials became distinct from office functions, the need for buildings devoted entirely to it arose. Record keeping meant, as factories grow larger, hiring more personnel, and providing a place to house them increased as well[12]. Two major developments arguably enabled the vertical expansion; the steel frame and the elevator. Although the high-rise building, in theory, could be sustained with the traditional structural system of masonry, the steel frame offered practicality -- speed of construction, maximization of space on each floor, and a reduction of material resulting in a relative reduction in expense. As land values, building costs, and rentals increased, steel frame was necessary to maximize the interior space without taking space itself. As steel expanded the high-rise building, elevators became necessary to traverse the great distances upwards. Although elevators were present during that time and used to transport cargo, the hoisting rope was subject to break. Elisha Graves Otis, an American industrialist, invented the safety brake as a response. However crudely designed, Otis's mechanism worked to keep him safe, as he demonstrated at the 1854 New York World's Fair.

No matter the nature of its inception, the form and function of the high rise has had a significant impact on architecture.

1909 THEOREM

> *"Our civilization is progressing wonderfully. In New York – by that I mean Manhattan Island – we must keep building and we must build upward. Step by step we have advanced from the wooden hut to the thirty story Skyscraper…Now we must develop something different, something larger…"*[13]

[12] Sarah Bradford Landau and Carl W. Condit, *Rise of the New York Skyscraper, 1865-1913* (New Haven: Yale University Press, 1999), 5-13.
[13] Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, new ed. (New York: Monacelli Press, 1994), 73-74.

The 1909 theorem, presented by the Globe Tower, revealed an ideal image of the performance of the high-rise; a steel structure that supports eighty-four horizontal planes, all the same size of the original plot. The multiplication of the artificial, virgin sites establishes a strictly private realm; incidents so disjointed by floors that it becomes inconceivable to imagine them within the same scenario. A life inside so fractured, the building becomes a stack of individual identities. In terms of urbanism, the indeterminacy of the programmatic elements does not enable a predetermined purpose for the site(s). Instead, they meet their own particular programmatic purpose; creating a form of unknowable urbanism, a metropolitan destabilizer, and a promise of perpetual urban instability. The elevator, a liberator from the ground floor, further segregates the building from the urban plane; "[a] self-fulling prophecy: the further up it goes, the more undesirable the circumstances it leaves behind"[14]. Architecture no longer became, in the early 20th century, the art of designing buildings. Rather, it was the brutal skyward expansion of the designated site; resulting in cities filled with architectural city states, all independent of each other and lightly tethered to the earth.

[14] Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, new ed. (New York: Monacelli Press, 1994), 68.

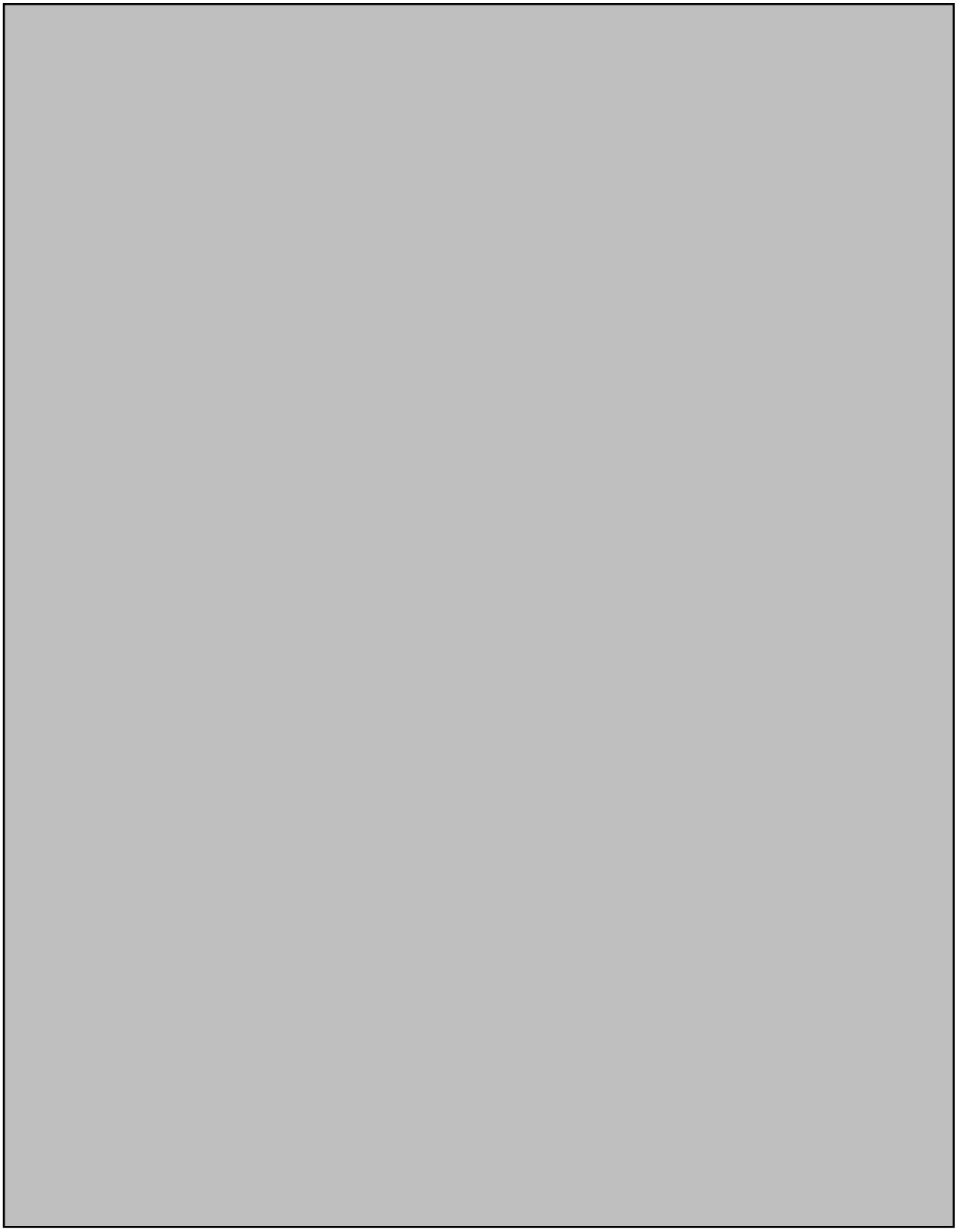


Figure 1: 1909 Theorem (Source: Delirious New York, Rem Koolhas)

IMPLEMENTATION

> *"Our internal perception of the world around us is greatly influenced by the verbal categories which we use to describe it. A modern urban street scene is wholly man-made and it is only because all the things in it carry individual names, i.e. symbolic labels, that we can recognize what they are"*[15]

The series of boundaries that demarcate the individual floors, or realms, of the high-rise building can be rethought. The initial step into the process is recognizing the high-rise model is not innate in the universe, it is a man-made construct; therefore, it can be adapted, re-written, or destroyed. The second is realizing that the high-rise model does not need to be the multiplication of the same property space endlessly upward, it is not one object. Rather the high-rise model can be made up of individual items, each different in spatial volume and configuration that together, coalesce into the high-rise.

Identification and skillful manipulation of these assumptions, using a method that strives to be protean, is one way by which to explore the possible change in meaning of the high-rise model.

[15] Edmund Ronald Leach, *Culture and Communication: The Logic by Which Symbols Are Connected*, Themes in the Social Sciences (Cambridge: Cambridge University Press, 1976), 33.

CHAPTER 3: SIMPLE DICHOTOMIES

> *"If you record unrehearsed conversation on tape you will find that on play-back very little of it is immediately comprehensible; yet, in context, all those present would have understood what was being said. This is because, in its original setting, the spoken utterance was only part of a larger whole"*[16]

Can the cultural lens be adapted, re-written, or destroyed? In order to test, it is important to recognize that our internal perception of the world is greatly influenced by the categories we use to describe it. As previously stated, culture is a social construct. It is only recognizable as a set because of the individual's signs, symbols, and signals that cohere together to form it. Edmund Leach, a socio anthropologist, believes that meaning depends on the contrast of these items. To illustrate his point, Leach writes that a *red* and a *green* light mean *stop* and *go* but only when they are next to each other in the proper context of the traffic pole. If, for example, the green light was seen on its own, it could be perceived to be a symbol for *On*. Similarly, if one were to discover a switch in the same vicinity of a door handle or window latch it would be safe to assume that it is the switch to turn the lights on. If that same switch were placed in the middle of a sidewalk we would not expect it to behave the same. The use of this symbols is to distinguish one class of things from another and by doing that, artificial boundaries are created in an otherwise continuous field[17].

The sanctuary of a gothic church is a recognizable space. It consists of high ceilings and large panes of glass covering the walls, a nave populated by pews that leads to the chancel, and great amounts of detail covering all material forming the space to make it appear less massive and

[16] Edmund Ronald Leach, *Culture and Communication: The Logic by Which Symbols Are Connected*, Themes in the Social Sciences (Cambridge: Cambridge University Press, 1976), 69.
[17] Edmund Ronald Leach, *Culture and Communication: The Logic by Which Symbols Are Connected*, Themes in the Social Sciences (Cambridge: Cambridge University Press, 1976), 33-35.

substantial. All these characteristics together to create an image of the Catholic church. If, for example, the height of the ceilings was dramatically lowered (ten feet high from the ground), would it still be recognizable as a gothic church? More importantly, is it still a gothic church? Most would say it is not. That is because meaning is created using simple dichotomies-high versus low ceilings, or lightweight versus heavy, etc. Since the hypothetical scenario did not contain within it the sets of characteristics to identify it as a gothic church, it therefore would most likely not be viewed as gothic. Between the two sides, however, there is a boundary condition. To inhabit that condition is to realize that it is neither a space that belongs to either side and a space that belongs to both at the same time; an ambiguous and ill-defined space.

Boundaries of social space, however, have much wider applications than those described. Ceremonies such as weddings, birthdays, and funerals are all threshold conditions that mark, in time, the transition from one state of being to another[18]. The purpose of this thesis is to explore that threshold condition within the context of the high-rise building model. The programmatic elements, much like the traffic light and the light switch, incorporate within them a specific set of signs, symbols, and signals that are used to recognize them; purposely creating distinct architectural spaces through the erection of boundaries. In the context of the high-rise, the floor slabs act as boundaries that work to keep floors discrete. This thesis will explore six different programs (religious center, art gallery, office, hostel, gymnasium, and retail) and attempt to create unyielding and continuous threshold conditions, resulting in "spatial continuities where

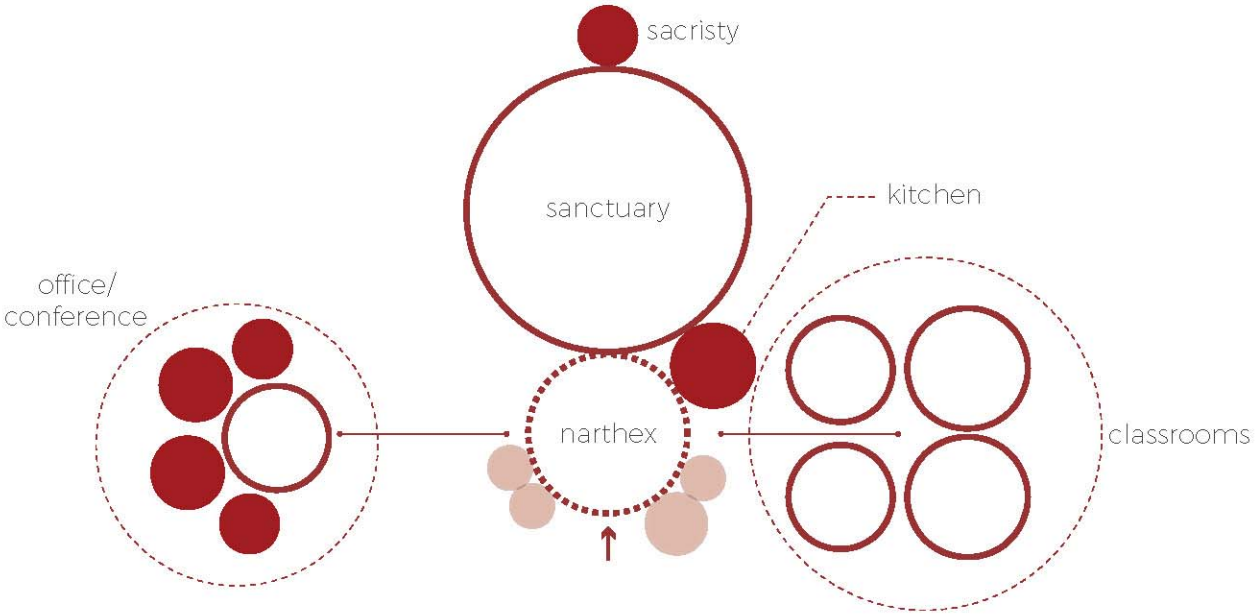
[18] Edmund Ronald Leach, *Culture and Communication: The Logic by Which Symbols Are Connected*, Themes in the Social Sciences (Cambridge: Cambridge University Press, 1976), 34-35.

one would anticipate clear divisions and divisions of space where one would anticipate continuities”.

RELIGIOUS CENTER

> *You cannot pray at home, like you can at church, where there is a great multitude; where exclamations are cried out to God as from one great heart, and where there is something more: the unions of minds, the accord of souls, the bond of charity, the prayers of priest – John Chrysostom*

Religious centers, which vary from churches, synagogues, temples, etc., refer to buildings whose main purpose is to house religious activities and facilitate religious worships. Led by a single or group of pastors, religious centers are used to teach the 'Word of God', encouraging its members in the progress of their faith. The sanctuary, the focal space of the church, is where the service is held and the congregation sits. The Chancel, located at the end of the nave, is the area of the church where parishioners sit or stand. Raised from where the congregation sits, the chancel serves as the home of the alter, tabernacle, pulpit, and chair of the priest or pastor. Connected to the chancel, the sacristy is a space used by the priest or pastor to prepare for service. In addition, the space is used to store the vestments along with items used for worship. The narthex, however, is the space that acts as the linchpin to the spatial organization of the church. It acts as the entry space to make the transition between the outside world and that of worship. It links the sanctuary and the chapel (a separate extension of the sanctuary where religious service is held) with the classrooms (for Sunday schools or after school programs), offices (for the pastor or priest), conference rooms, and kitchen. Although service might be held a few times a week, these institutions, initially founded on faith, are not always tied to religious activities. Instead, they have become a staple of the community that house, in addition to worship, several secular activities such as weddings and funerals. The overall space has to accommodate large gatherings of at least three-hundred guests.



church	#	sq. ft.
narthex	1	500
sanctuary	1	2000
chapel	1	500
sacristy	1	100
classrooms	4	400/300
conference room	1	300
offices	4	150/100
kitchen	1	200
restrooms	2	50
coat closet	1	70
janitor closet	1	50
storage	1	100
total		5820

Figure 2: Church Square Footage (Source: Author)

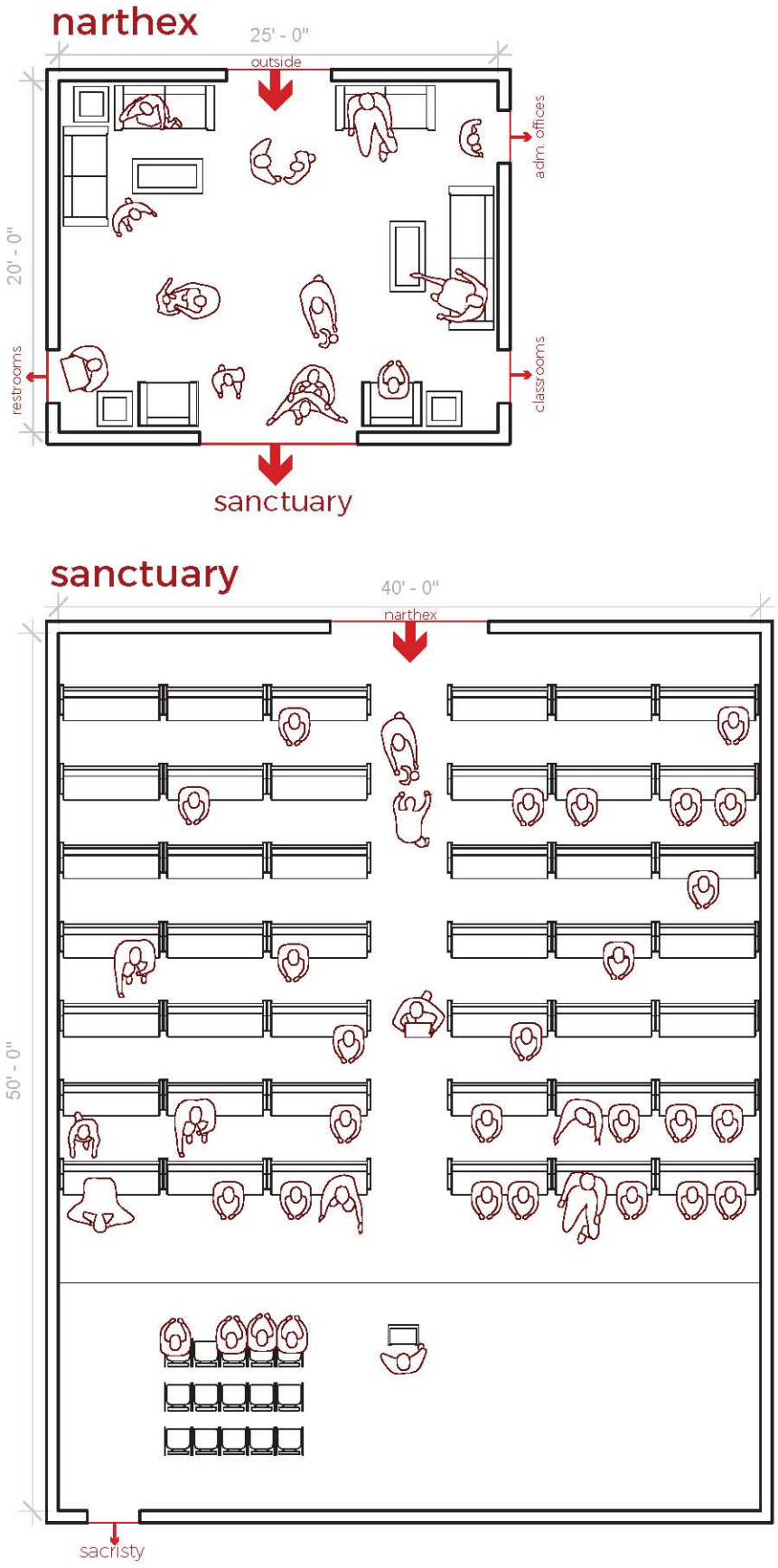


Figure 3: Church Space Diagram 1 (Source: Author)

Figure 4: Church Space Diagram 2 (Source: Author)

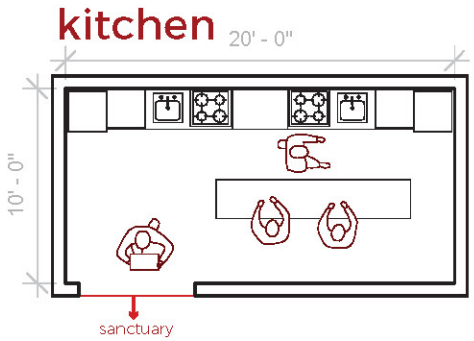
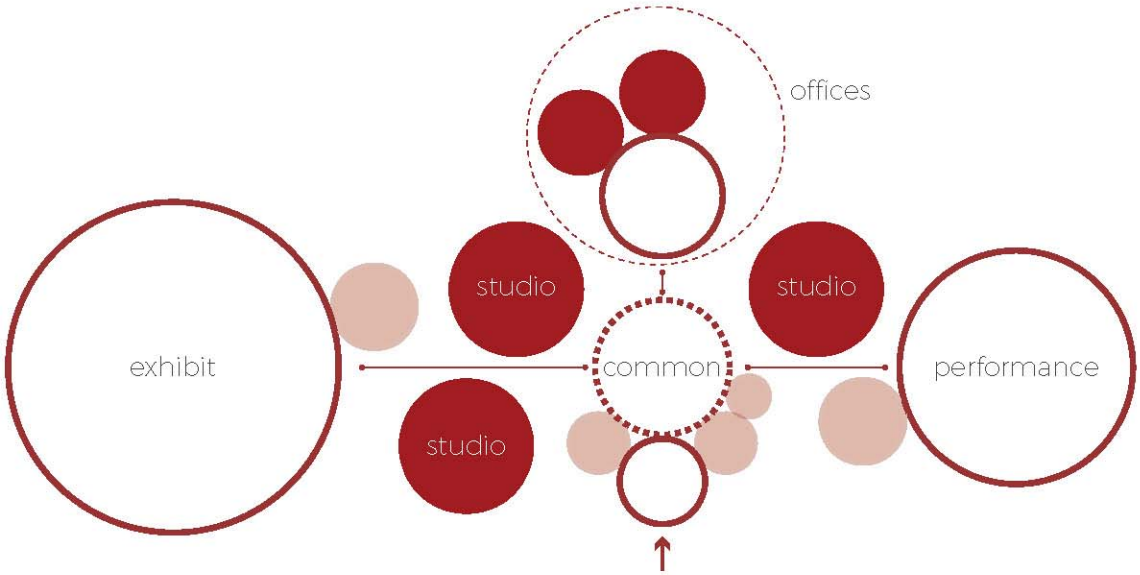


Figure 5: Church Space Diagram 3 (Source: Author)

GALLERY

> *Art is inspiring. Walking into a gallery, or when the lights go up on a stage; that thrill of getting something that has nothing to do with acquisition – Sadie Jones*

Gallery spaces act as a center for artistic invention and presentation for a diverse group of artists. At it heart it is a place for the public to engage the work of an artist, the art gallery is a space designed specifally to create an environment that enhances the viewing of artistic pieces; fostering a space that facilitates the exchange of ideas that help build the artistic community. The difference between a random object and an art work itself is predicated upon the demarcation of a difference between where art is placed and where other objects reside that are not art. In addition to designating what is art the gallery also can have an educational function; often providing studio like spaces for the creation of their work or holding community wide art classes to transfer their knowlegde and craft. The principle purpose, however, is the exhibition. The most prominent space in the gallery, the exhibition space can be organized to accommodate a variety of artisitic pieces using movable walls and custom hanging arrangements. These spaces tend to be spacious, horizontally and vertically, to accommodate unusually large pieces of work while simultaneously being concious of the circulation of a large amount of people that come to partake in the exhibit. The performance center, a space that highlights the work of dancers, actors, etc., is similar to the exhibit space, in that it is a large room that can be shaped by the performers, but needs accomodations for guests to seat and a stage for performances. The piece that links these two spaces is the common area. Directly connected to the lobby, the common area acts as a breathing room; a place where guests can mingle as they wait for the exhibit to open or the second act to start. In addition, the common area access to the supporting spaces; this includes the offices and conference rooms for the art directors and their staff.



gallery	#	sq. ft.
lobby	1	200
common area	1	500
studios	3	500
exhibition space	1	3000
performance center	1	1500
conference room	1	400
offices	2	200
restooms	2	100
coat closet	1	70
janitor closet	1	50
storage	2	200
total		8220

Figure 6: Gallery Square Footage (Source: Author)

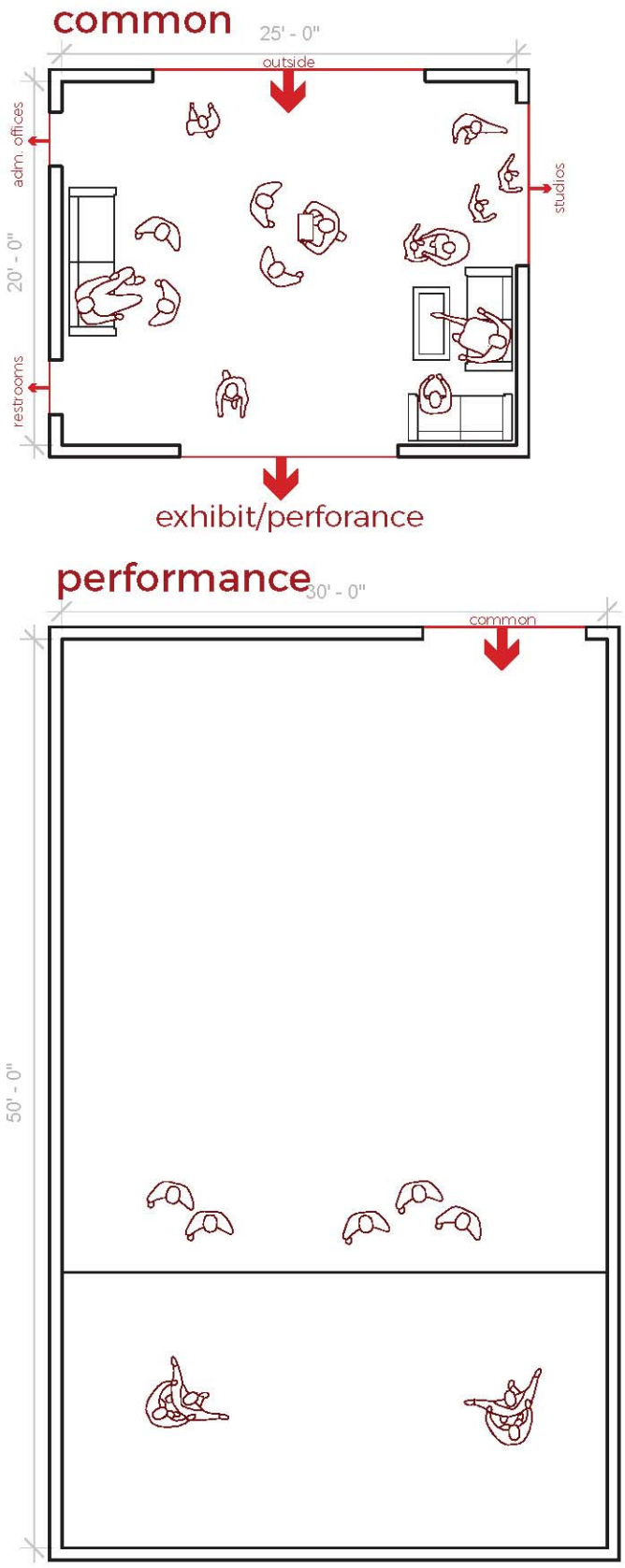


Figure 7: Gallery Space Diagram 1 (Source: Author)

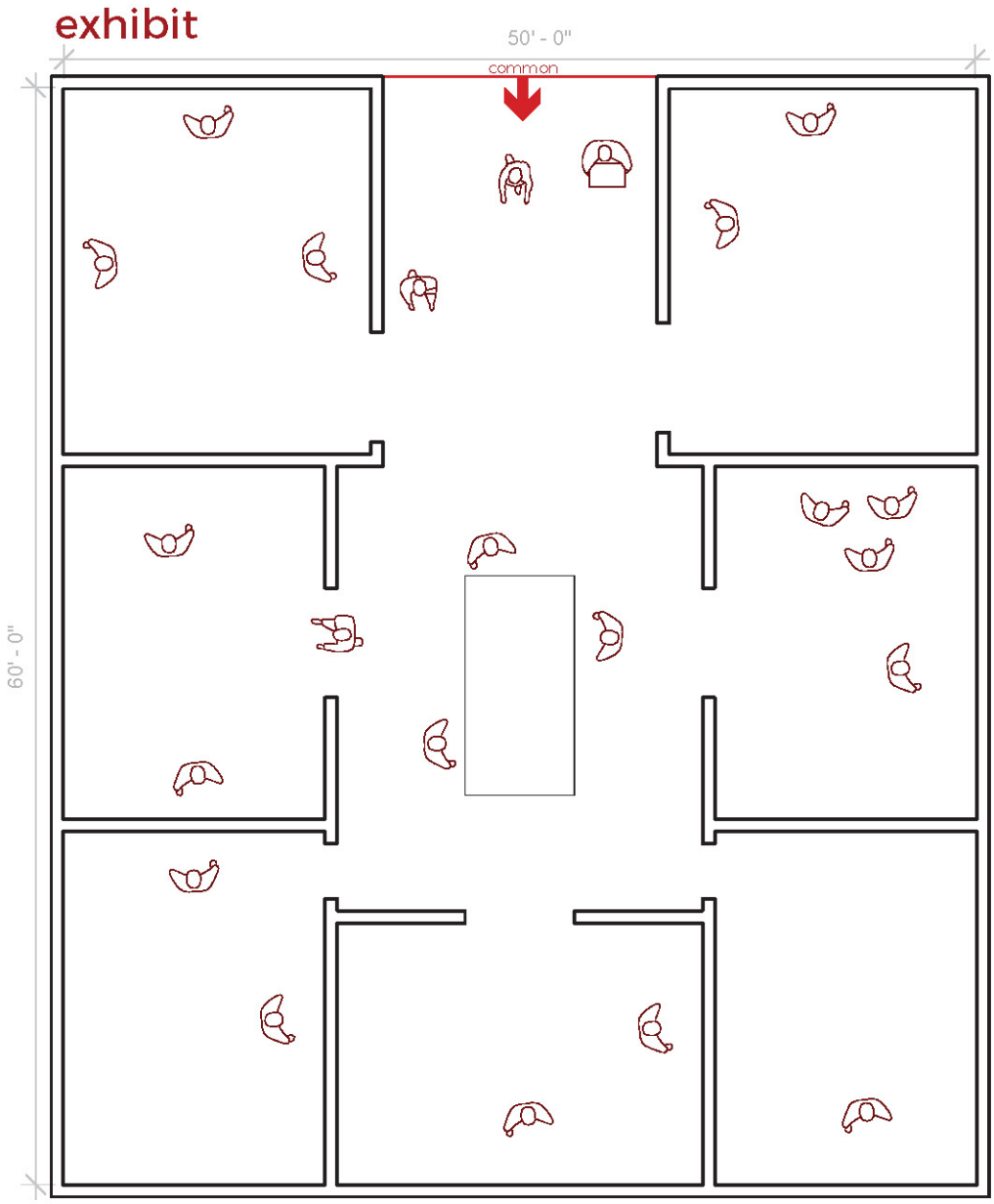


Figure 8: Gallery Space Diagram 2 (Source: Author)

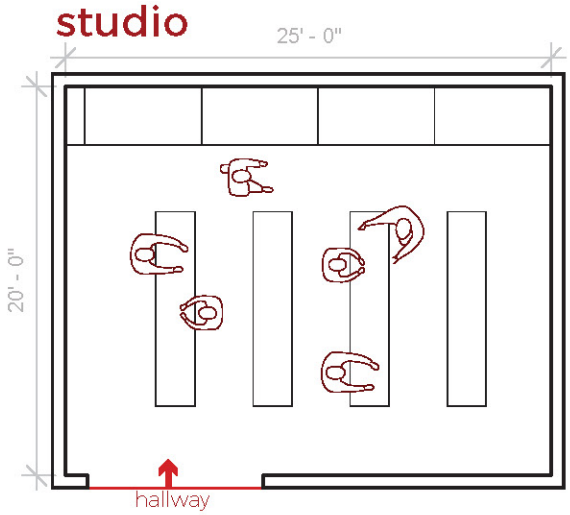
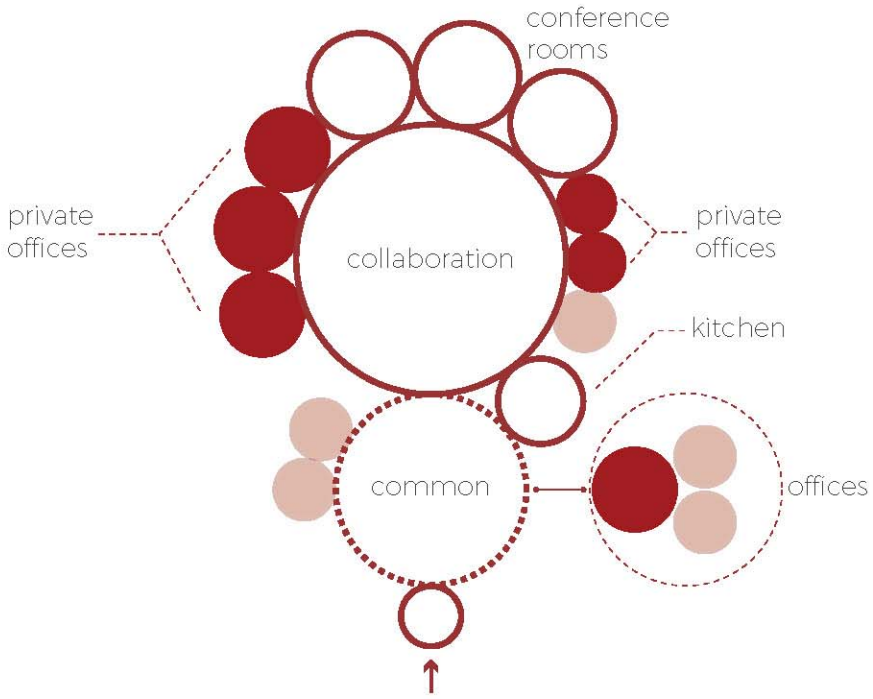


Figure 9: Gallery Space Diagram 3 (Source: Author)

CO-WORKING OFFICE

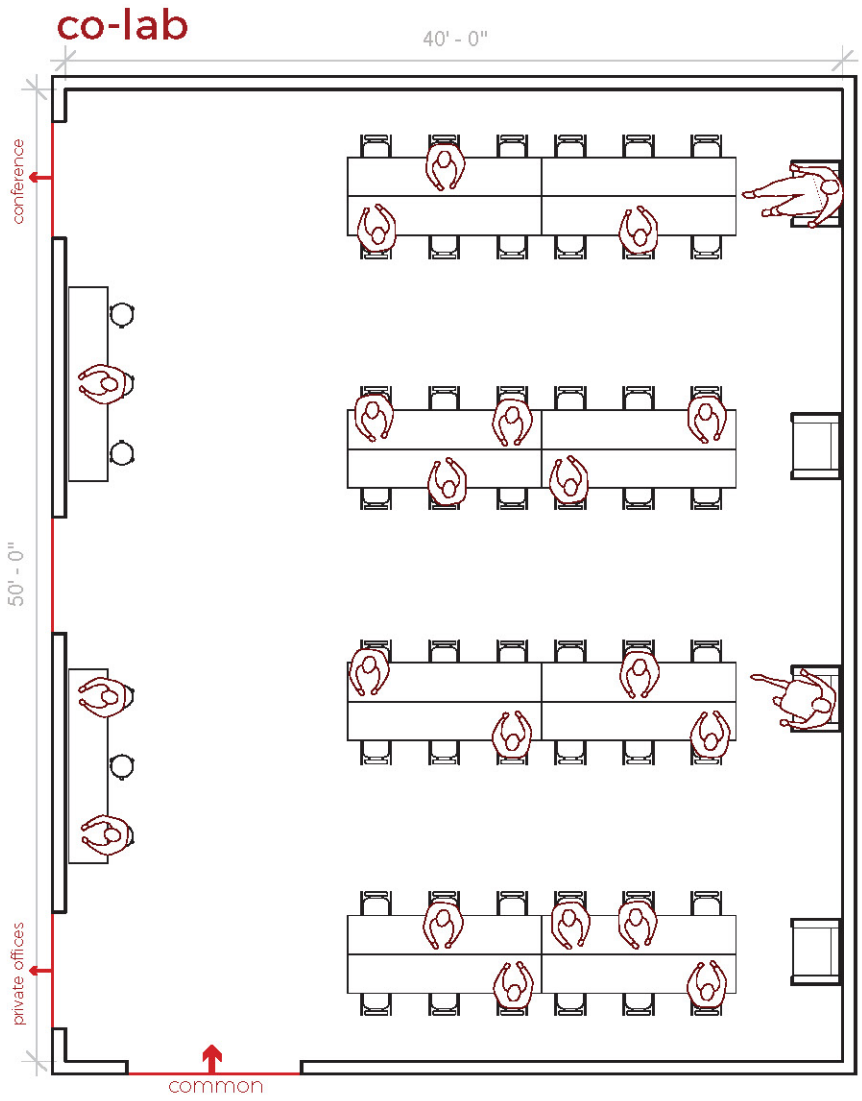
> *Co-working hinges on the belief that innovation and inspiration come from cross pollination of different people in different fields. Random opportunities and discoveries that arise from interactions with others play a large role – Night Owls Press*

A co-working office is an environment where people can come and pursue their professional work. Unlike the traditional office, co-working spaces consist of members who come from a range of different industries; creating the opportunity to receive insight from the perspective of different colleagues/professionals. The major factor in the rise in popularity is the price. Unlike renting space in an office building, members can pay monthly or annually for a seat at a table; essential for entrepreneurs with small teams who want to work in a professional environment without high overhead while they launch their business. This is enabled partly due to the design of the collaboration room. Extremely large and open, the space is populated with a range of work places, informal sitting, individual desks, community tables, and conference rooms for people to conduct their business. The separation that comes with the traditional office is non-existent; acting as a social catalyst for professional work. Co-working spaces often offer the ability for an individual or a small team to rent an enclosed office space. These spaces function as a regular office and are connected to the main collaboration space. Adjacent to the offices, conference rooms are needed to hold meetings with clients, potential investors, partners, etc. These spaces can be rented out for a few hours at a time to be used by any of the members. The common space, considered the hub of the office, functions the same way as the main collaboration space but it has a more informal atmosphere. It is an area for people to congregate and socialize; typical to a break room in a regular office building. In addition to informal work spaces, common spaces contain game areas as well as access to the kitchen space.



office	#	sq. ft.
lobby	1	100
common space	1	1000
collaboration space	1	2000
conference rooms	4	300/200
private offices	5	200/100
adminstrative offices	2	100
kitchen	1	200
restrooms	2	100
janitor closet	1	50
storage	1	100
total		5650

Figure 10: Office Square Footage (Source: Author)



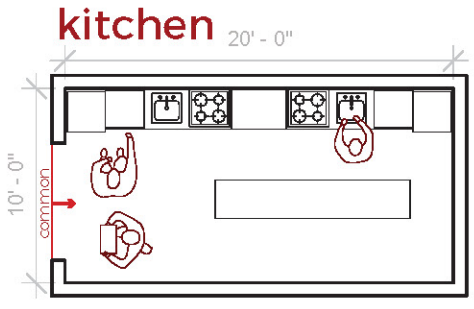
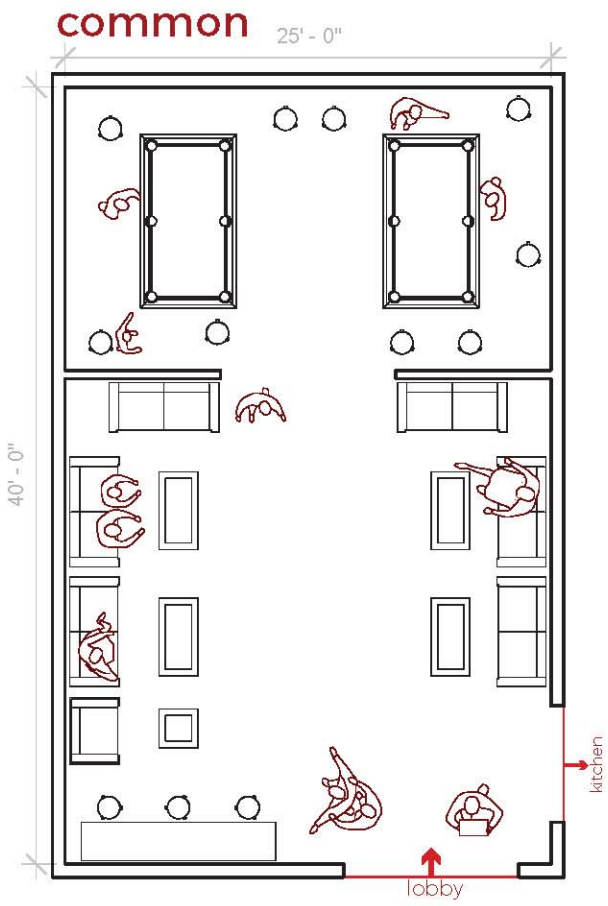


Figure 11: Office Space Diagram 1 (Source: Author)



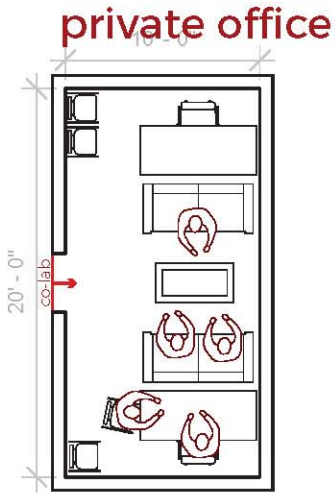
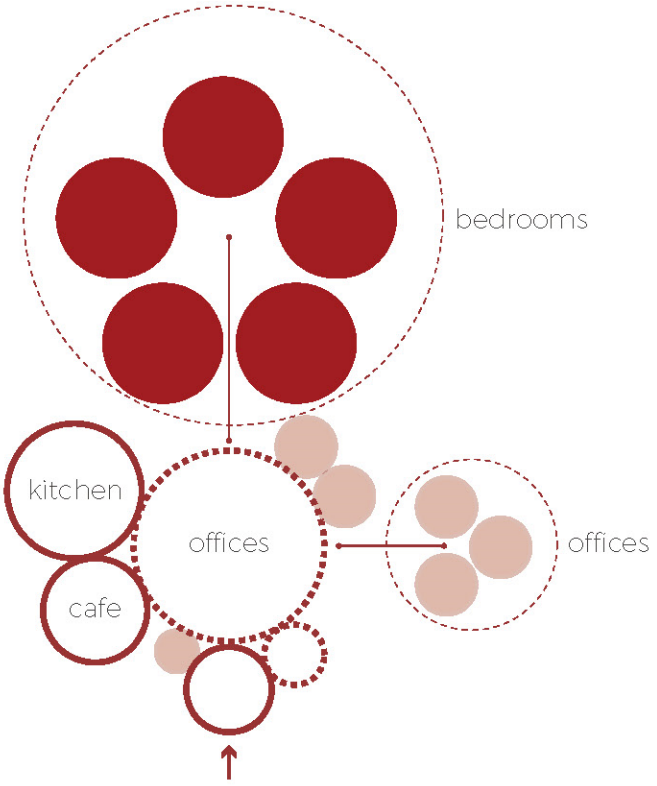


Figure 12: Office Space Diagram 2 (Source: Author)

HOSTEL

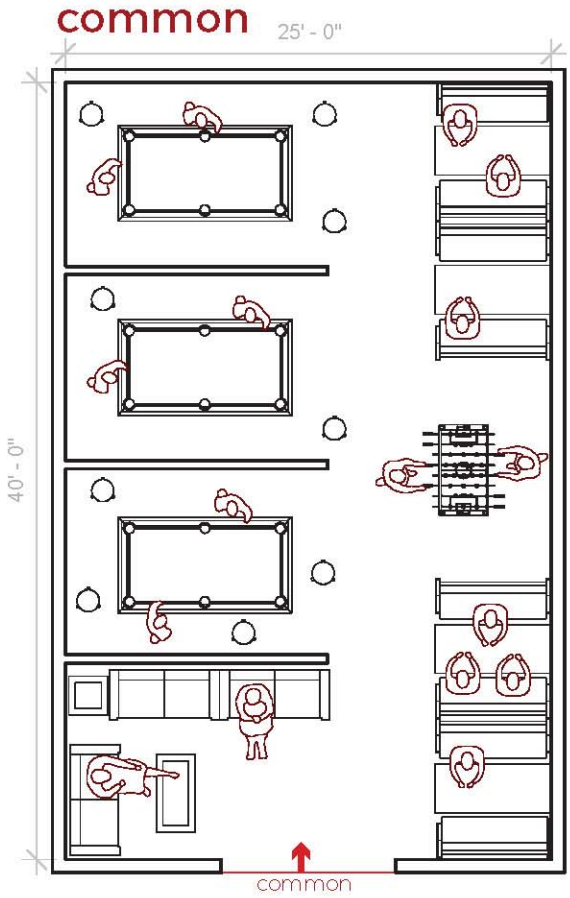
A good traveler has no fixed plans, and is not intent on arriving – Lao Tzu

A hostel is a budget-oriented, shared dormitory type room that provides travelers, individually or in groups, short term housing. Unlike the traditional hotel rooms, guests in hostels rent beds instead of rooms. These rooms accommodate between six and twenty people with beds or bunkbeds. Groups not large enough to occupy the whole room often find themselves sharing with fellow travelers. The rooms themselves offer the essential; beds, as mentioned before, are provided with small amount of desk and shelf space. Some include lockers within the rooms or near the lobby to secure your belongings while travelers explore the city. Bathrooms are either attached to the individual rooms, which is rare. Or bathrooms are shared among the floor; accessed from the hallway. Hostels, however, signify more to the traveler than a bed. Hostels act as social hubs for residents; a space to congregate and share each other's company. Therefore, hostels often include a common space that can range from spaces that are quiet and intimate to play/game rooms. The common space is often connected to the kitchen. Kitchens in hostels serve two functions: provide prepared meals and/or allow guest to make their own. The space itself accommodates multiple guests at once to allow multiple meals to be prepared. Sometimes, the kitchen is part of a larger kitchen that supports either a bar or a café space. The kitchen and café spaces that are attached to the common space act as an extension of the gathering space providing an environment for the residents. The building the hostel inhabits typically determines the design. No two hostels are the same; allowing for unique spatial experiences from one hostel to the other.



hostel	#	sq. ft.
lobby	1	200
bedrooms	6	400
common space	1	1000/750
kitchen	1	500
offices	3	100
lockers	1	100
bar/cafe	1	300
restrooms	2	100
janitor closet	1	50
storage	1	50
total		5100

Figure 13: Hostel Square Footage (Source Author)



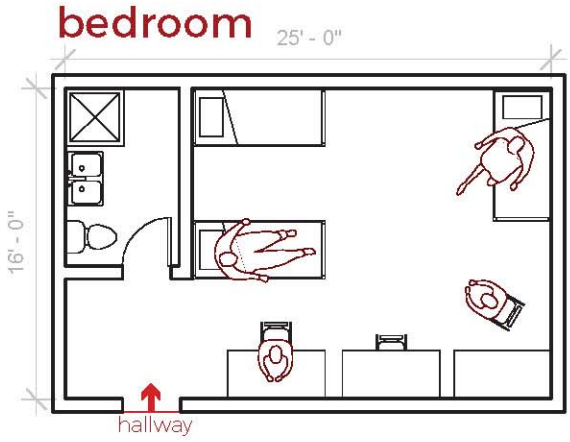
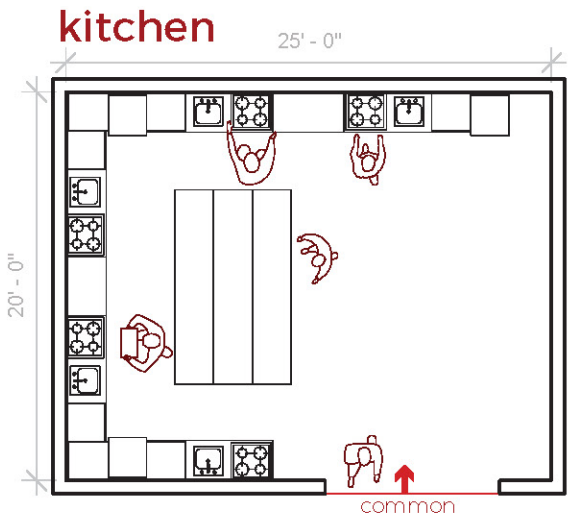


Figure 14: Hostel Space Diagram 1 (Source: Author)



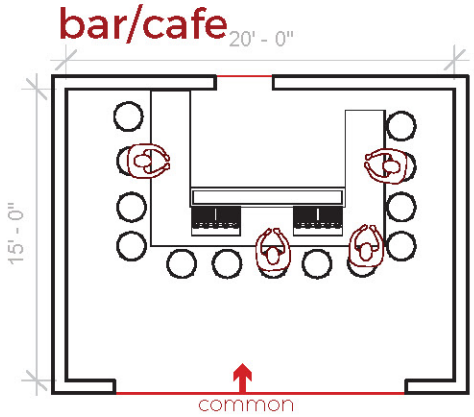
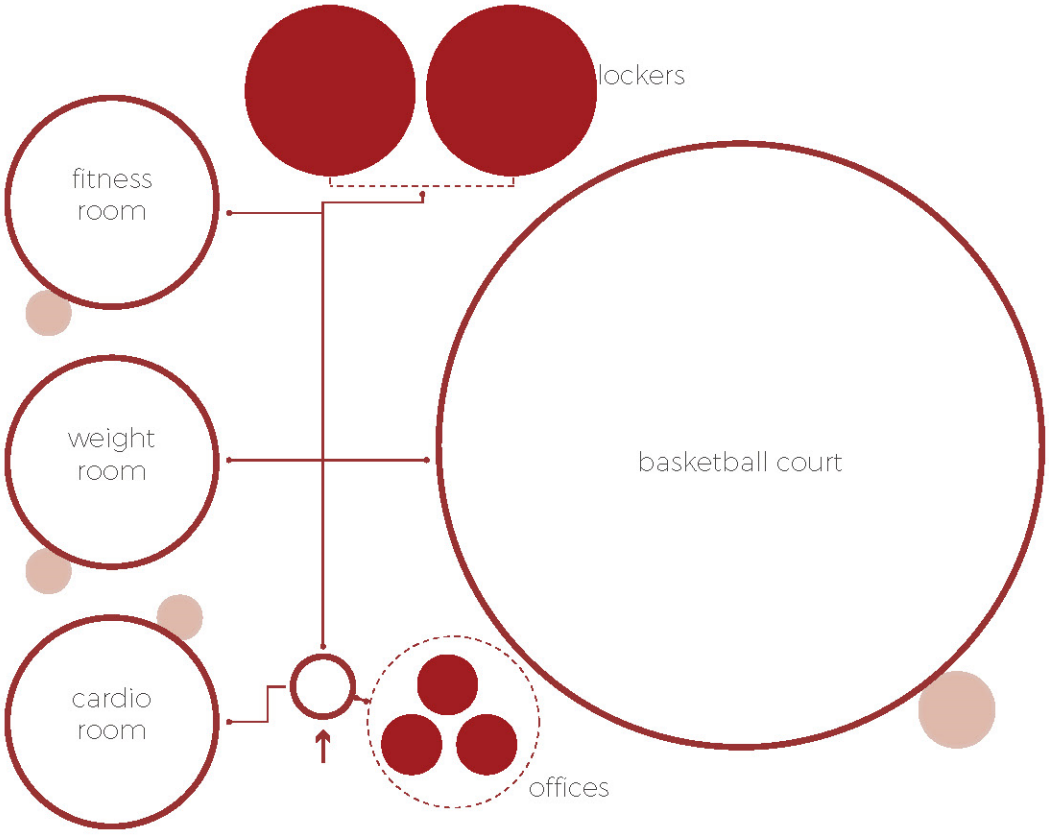


Figure 15: Hostel Space Diagram 2 (Source: Author)

GYMNASIUM

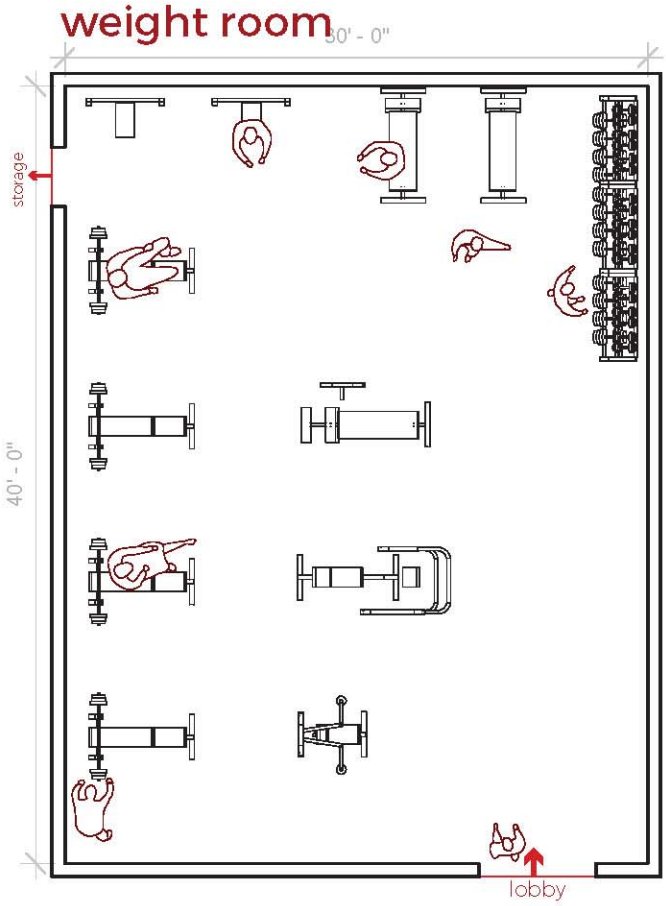
> *I started running around my 30th birthday. I wanted to lose weight; I didn't anticipate serenity. Being in motion, suddenly my body was busy and so my head could work out some issues I had swept under a carpet of wind and cheese. Good therapy, that's a good run – Michael Weatherly*

A gym is an open air or enclosed space used by the public for gymnastics, athletic, and other services pertaining to the enhancement of the body. The size and the types of spaces depend on the kind of service the gym provides. For the purposes of this thesis, the modern gym will be the focus of discussion. The spatial arrangement consists of a small lobby with a reception desk at the entrance with paths that lead to the lockers and workout spaces. The locker room is the spaces used to transition from the outside world to that of the gym. Ample lockers should be provided to store personal belongings with bathrooms and showers directly linked to enable that ease of transition after the end of the workout. There are three specific spaces, each distinct from the other, that usually occupy these gyms; the weight room, the cardio room, and the fitness room. The weight rooms focus on the proliferation the muscle. Gym paraphernalia, such as bar-bells, dumbbells, weights, and weighted machines are scattered and arranged in a large, flexible space. Cardio refers to cardiovascular exercise, which pertains to low to high intensity aerobic exercises, such as running/jogging, swimming, cycling, and walking. Although the spaces are outfitted with exercise machines, ample space is dedicated for body workouts. The fitness rooms, compared to the other two, are lacking in equipment. Often taught by a fitness instructor, groups of people congregate in theses spaces for high intensity body exercises. Storage space, containing items required by the instructor, should line the periphery of the space. Lastly, not common in most gyms but in a select few, exists a large court used for basketball, volleyball, indoor soccer, and any other activity that the initial spaces cannot accommodate.



gym	#	sq. ft.
lobby	1	100
weight room	1	1200
cardio room	1	1200
fitness room	1	1000
locker room	2	800
basketball court	1	5000
offices	3	100
storage	4	150/50
total		11500

Figure 16: Gym Square Footage (Source: Author)



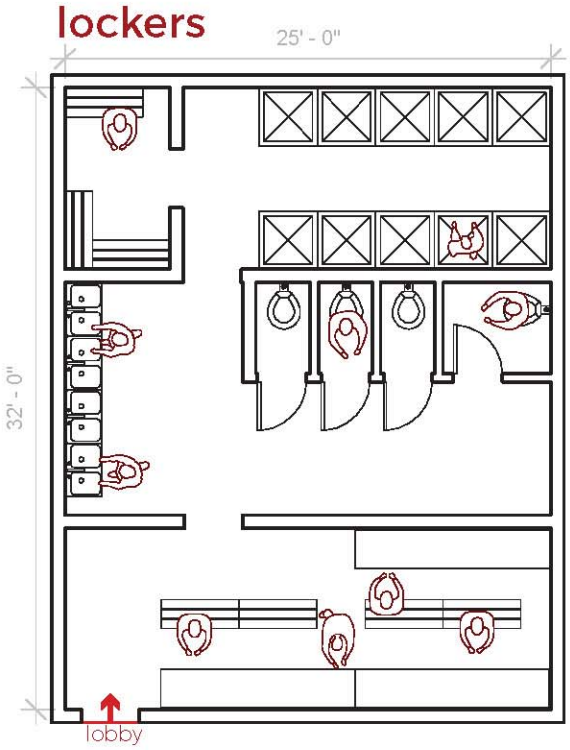


Figure 17: Gym Space Diagram 1 (Source: Author)

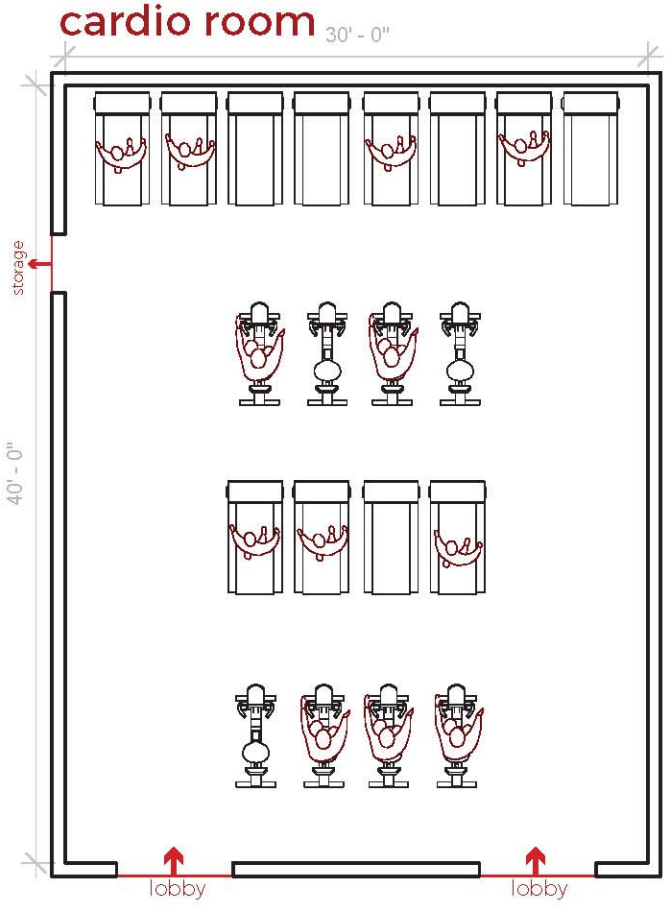


Figure 18: Gym Space Diagram 2 (Source: Author)

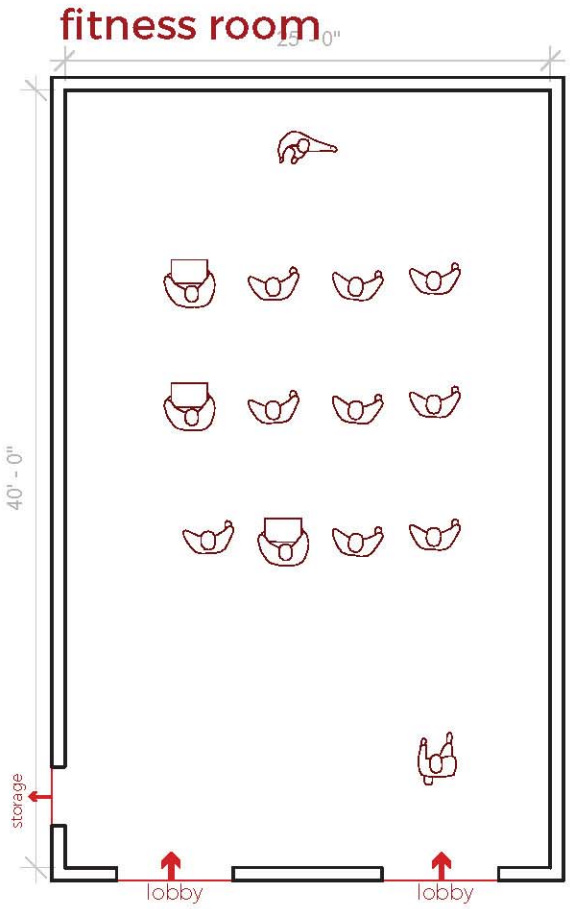
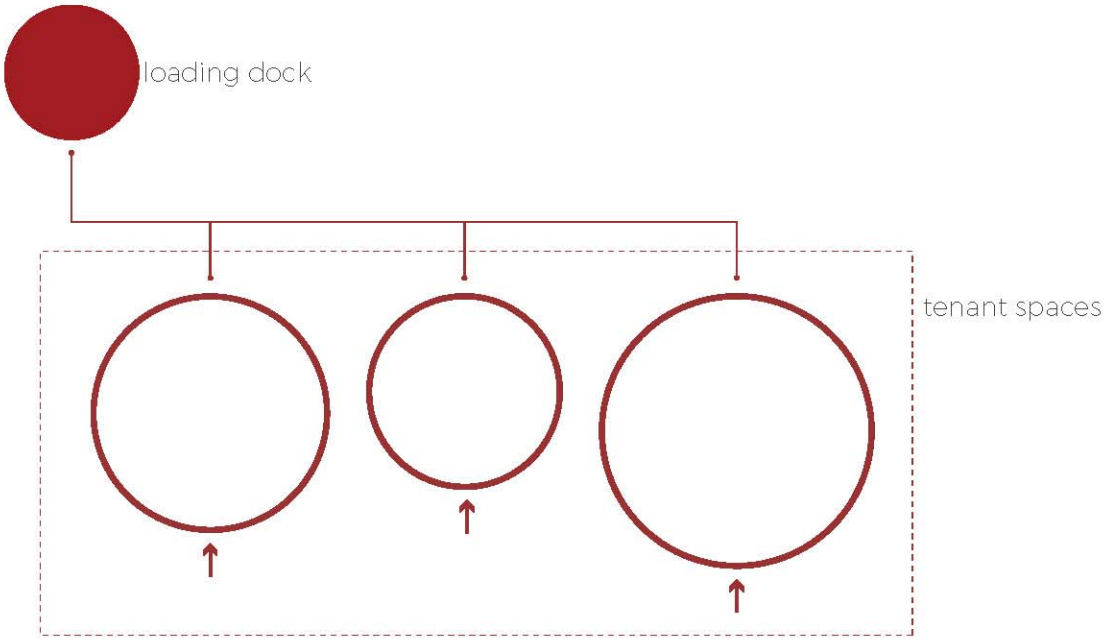


Figure 19: Gym Space Diagram 3 (Source: Author)

RETAIL

Retail spaces enable the sales of goods to the public in small quantities for use or consumption. Usually located on the lower levels, retail spaces are engaging the people on the urban plane. The design of a retail space can range from store to store. Each has a specific product that attracts a certain clientele which might call for a different interior design. There are, however, certain elements that are necessary for each tenant can fit out the space to a specific set of guidelines. Fit out is a term used to describe the process of making interior spaces suitable for a certain occupation. The base construction is completed by the developer and the final fit out is done by the occupant. The space is then leased by the occupant from the developer or landlord. The retail store consists of a large, flexible space where the merchandise is displayed, by use of shelves and tables, for customers to peruse. By the entrance, but not always, there is a register for the purchases of said merchandise. In the back, away from the public eye, there is storage units meant to hold extra inventory along with restrooms for the employees. The back also connected to a hallway that leads to a loading dock.



retail	#	sq. ft.
loading dock	1	500
tenant spaces	3+	2000/1000
total		5000+

Figure 20: Retail Square Footage (Source: Author)

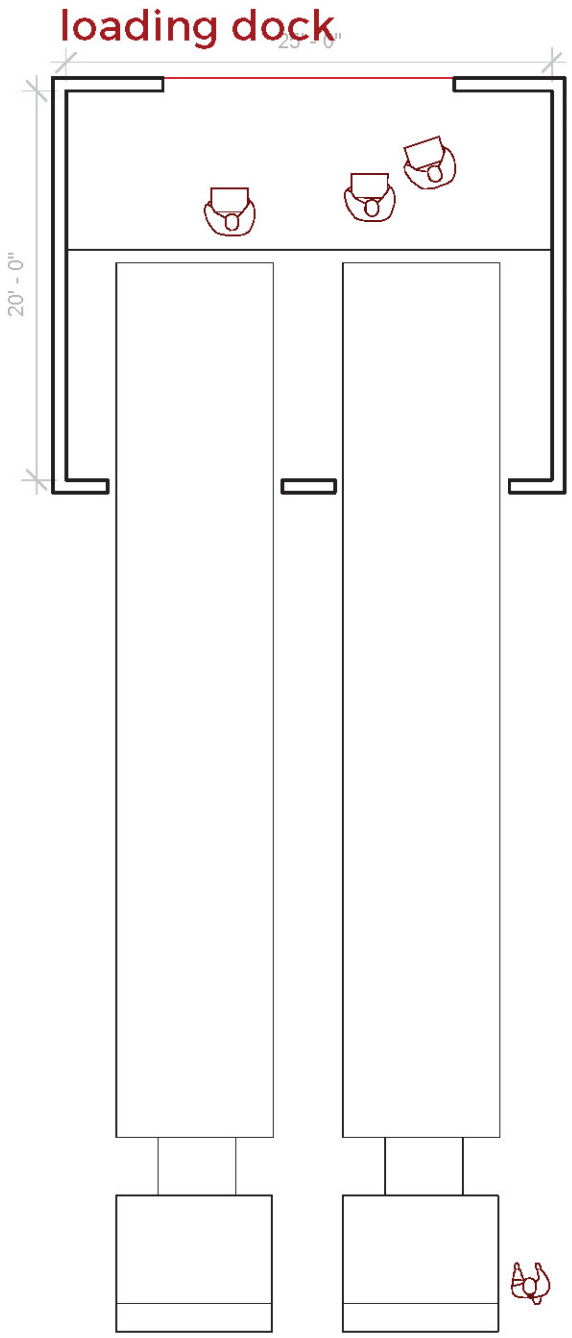


Figure 21: Retail Space Diagram 1 (Source: Author)

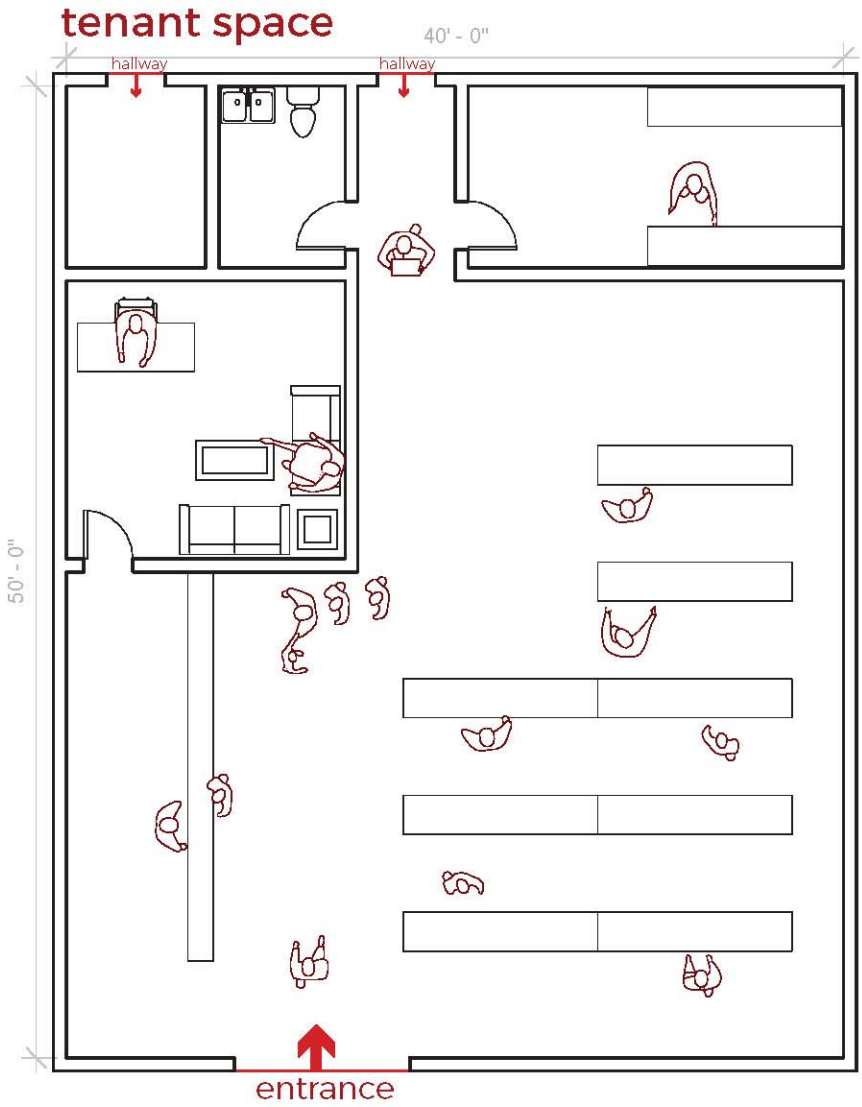


Figure 22: Retail Space Diagram 2 (Source: Author)

CHAPTER 4: PRECEDENT ANALYSIS

An attempt to coalesce several different programs within the same building is no new concept. Mixed-use buildings have been prevalent in the city for decades. The problem arises, however, in the resulting isolation. Much like suburbia, high-rise buildings are developed much the same way; there are strictly bounded houses/building with determined programs each divided from each other and accessed by a transportation corridor. One can imagine the space residing and divided by the floors as buildings with the transportation corridor similar to the elevator. Even if the comparison holds some merit, the experience of the human urban plane is inconceivably different from that of a high-rise. That model is, however, beginning to change.

THE HIGH-RISE MODEL

As previously acknowledged, a model is a set of symbols whose relationship to one another model relations among entities. The Home Insurance Building, constructed in Chicago, Illinois in 1884, was the first tall building to use steel frame construction. Arguably the first high rise building to be constructed with only ten stories and a height of hundred thirty-eight feet, the Home Insurance Building became a precedent for the proliferation of high-rise buildings in the early 20th century. Architectural icons such as the Flatiron Building (Daniel Burnham), City Investing building (Francis Kimball), and the Equitable Building (E.R. Graham) in Manhattan follow the same model presented by the Home Insurance Building; the endless upward extrusion of a plot of land that coalesce to a single form but with distinct and disjoined spaces. A hundred years later, the core idea has not changed. The process by which present day high-rise buildings are designed have not substantially shifted from this early model (the changes we witness tend to be results of constraints placed ion the extrusion of the lot outline by zoning laws or formal

manipulations within the zoning constraints to produce sculptural profiles and forms). The illusion of architectural advancement is falsely perceived, as parallel with the advancements of technology. Technology, however, has suppressed the potential of the high-rise building and instead made it a victim of banal improvements of electricity, air conditioning, illumination, and communication[19]. As mentioned earlier, within the congregation of high-rise buildings in cities, there are a few that begin to stray away in order to create concepts that don't follow verbatim the model developed by the initial high-rise but instead create designs that are the model 'of' the current context. The Roy and Diana Vagelos Education Center and Museum of Image & Sound were specifically chosen because they exhibit designs that put the experience of the high-rise, through the eyes of its users, first. The precedent analysis will begin, however, with the realization of the 1909 Theorem in the Downtown Athletic Club.

DOWNTOWN ATHLETIC CLUB

> *"Of all the floors, the interior golf course – on the 7th – is the most extreme undertaking: the transplantation of an English landscape of hills and valleys, a narrow river that curls across the rectangle, green grass, trees, a bridge, all real, but taxidermized in the literal realization of the 'meadows aloft' announced by the 1909 theorem"*[20]

Built in 1931, the Downtown Athletic Club is a series of thirty-eight superimposed platforms, more or less the size of the original area, located on the bank of the Hudson River near Battery Park on the southern tip of Manhattan Island. At the time of its construction, the athletic club contained a full spectrum of facilities, including squash and handball courts, boxing rooms, and aquatic pools on the lower floors, eating, resting, and socializing between the 13th till the 17th

[19] Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, new ed. (New York: Monacelli Press, 1994), 72.
[20] Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, new ed. (New York: Monacelli Press, 1994), 130.

floor, and bedrooms between 20th to the 30th floors. Compared to the previous high-rise buildings, produced to accommodate the increased necessity of office space by the industrial revolution, the athletic club stood in high contrast. Instead of housing two programs, typically a public retail level and a series of stacked office spaces, the Downtown Athletic Club was able to house a multitude of programs specifically designed around the metropolitan man within the same building. These differing programs, however complimentary to each other, are spatially divided by floors and walls. A critique of the 1909 Theorem, Starrett & Van Vleck, architects of the club, embraced the idea of the disjointed happenings on the different levels and strived to create a different, unique realm within each floor of the building. The lack of overlapping programmatic elements in the athletic club that this thesis attempts to create however does not infringe on the analysis of it; the very existence of a variety of programs within one location creates the opportunity to explore it. The high-rise buildings that populate the city since the 1900s have, in a way, taken a step backward from the thesis presented by Starret & Van Vleck. By using the plan as a tool, the architects created an abstract composition of activities given by its name, a fragment of the larger spectacle that occurs in the Metropolis[21]. Rem Koolhaas, in *Delirious New York,* was not in praise of the club but rather saying the full potential of each individual activity housed within the building could never be realized within the confines of the plan. Combined with the aleatory form of planning, the Downtown Athletic Club is a great, urban destabilizer. The remedy, or at least the next step in the experiment, is the inclusion of the section, to disrupt the monotonous repetition of floors and to liberate from the plan, and a

[21] Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, new ed. (New York: Monacelli Press, 1994), 131-132.

predetermined set of programs(s) the design can be tailored to; effectively anchoring the building to the site.

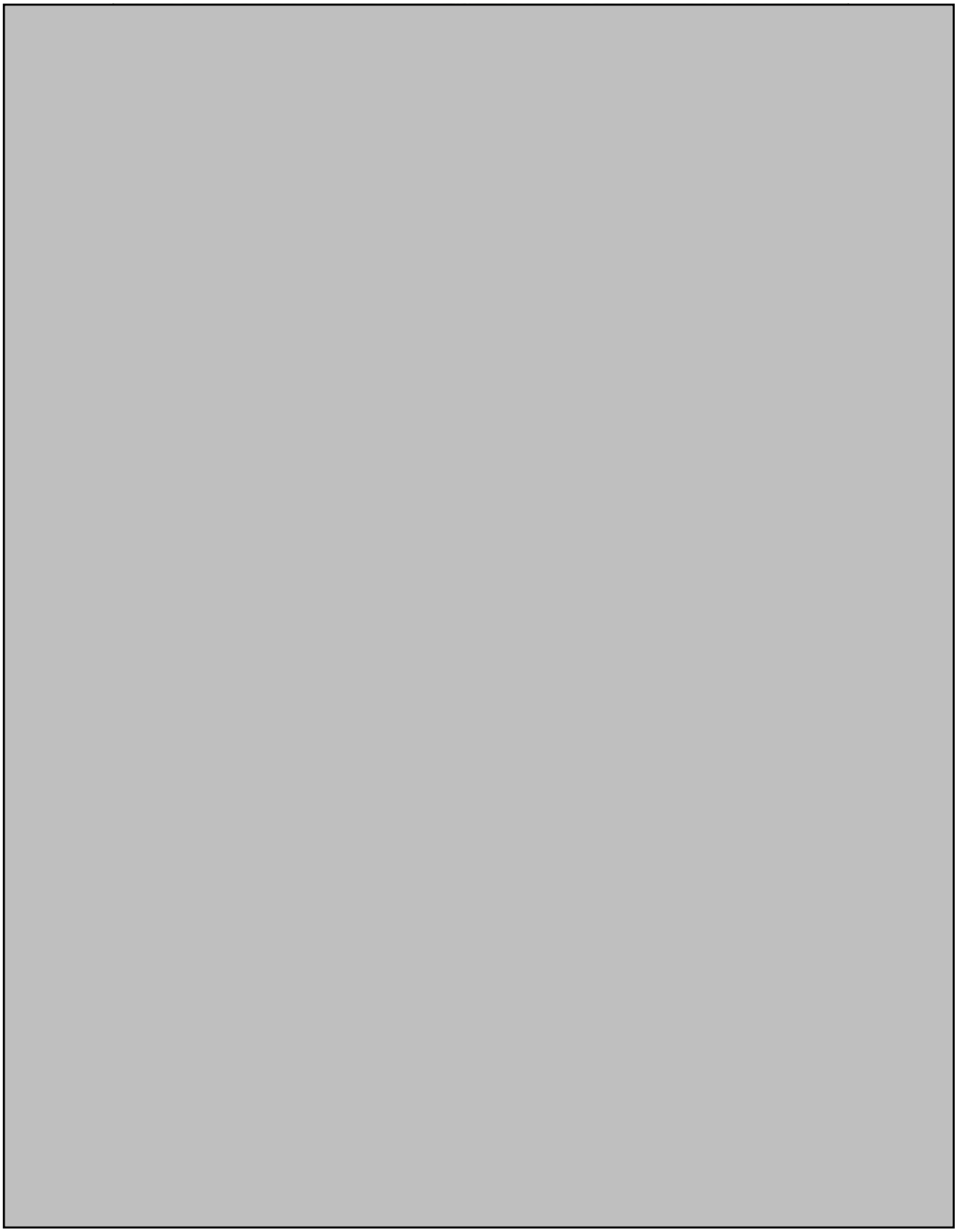


Figure 23: Downtown Athletic Club (Source: Delirious New York, Rem Koolhas)

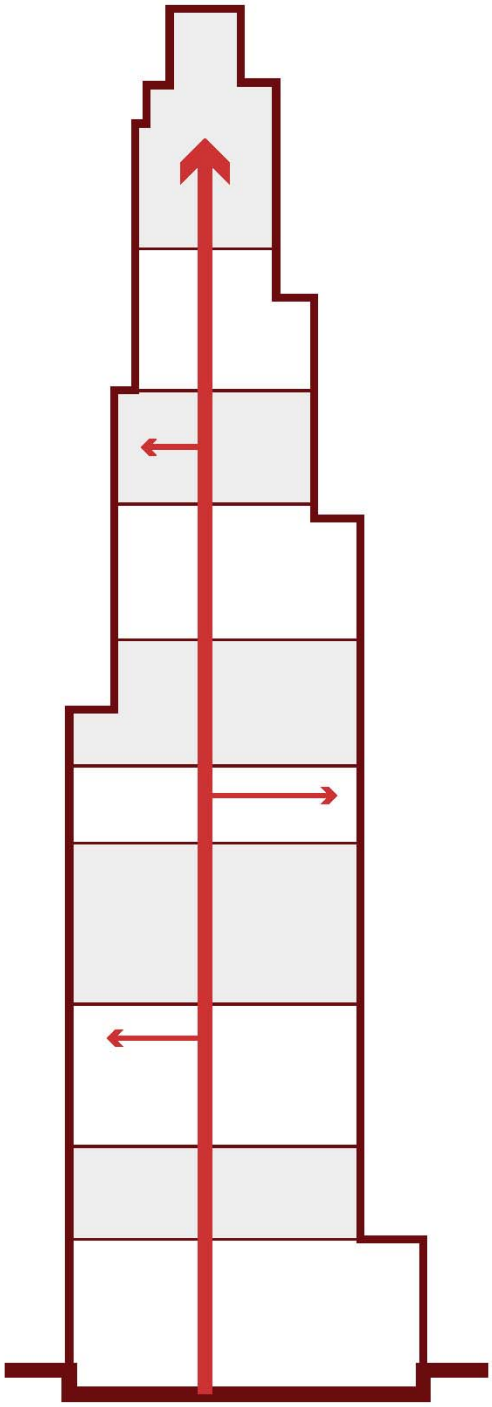


Figure 24: High-Rise Circulation (Source: Author)

Columbia University Medical Center

COLUMBIA UNIVERSITY: ROY AND DIANA VAGELOS EDUCATION CENTER

Designed by Diller Scofidio + Renfro, the Vagelos Education Center is a medical education facility for graduate medical students at Columbia University. The hundred thousand square feet., fourteen-story glass tower located in New York City contains advanced classrooms, collaboration spaces, and simulation centers to reflect the way of teaching, learning, and practicing modern medicine in the 21st century[22]. The primary focus in this precedent study is what Elizabeth Diller, founding partner of Diller Scofidio + Renfro, calls the 'Study Cascade'.

Cultural Adaption. Designed to be conducive to team-based learning and teaching, the organization of the interior spaces resulted in a network of social and study neighborhoods distributed along an exposed, interconnected vertical staircase that extends the height of the building. There are two ideas articulated in the last sentence that directly apply to this thesis. The first is designing a space to accommodate the current needs of medical students. The way students are learning and being taught is significantly different than what it was in the past. The benefits and practical applications of collaborative work is outweighing the outdated method of solitary study confinement. Students not only learn from teachers and books but each other as well. The way schools and libraries are currently designed support the solitary approach; disabling student's ability to congregate and collaborate on projects. The Vagelos Education enter is another contribution to an effort to promote collaborative spaces in educational environments.

[22] Diller scofidio renfro. "The Roy And Diana Vagelos Education Center." Columbia University Vagelos Education Center | diller scofidio + renfro. Accessed January 20, 2017. http://www.dsrny.com/projects/columbia-medical-center.

Continuous Space. Although the decision to design and promote a space that correctly reflects the current context of learning is progressive, the method by which it was executed is noteworthy as well. Unlike the Downtown Athletic Building, the design intent of the medical center was to create a place that was not only porous and transparent, but was able to be read as one, continuous space extending from the main entrance through the height of the building. The resultant design, named the Study Cascade, proceeds through fourteen levels of the building, populated with areas that promote students to congregate and collaborate, without being divided into, or defined as, a separate area. Ultimately, the design unifies the space vertically and averting one of the shortcomings predicted by the 1909 Theorem.

Critique. This space, however only occurs on the north end of the building. As the design recedes towards the southern end of the medical center, the floor plates and configuration withdraw to the traditional design of the high-rise; monotonous floors, superimposed on each other, segregating one level from another. The separation, and the border created as a result, is due to the change in program. The traditional classrooms and medical simulation rooms are designated to that end, effectively disconnected from the Study Cascade. This separation of program can be rethought. By taking the sets of symbols that represent each program and reorganizing, adding, subtracting, reorienting, and manipulating, the boundaries aspects of the program can coalesce and create an ambiguous space relationship. The space, as it currently stands, is identified and labeled as a study/collaboration space; a label that is by a clearly demarcated border. Without another intersecting and overlapping programs to contrast with one another in a condition of simultaneity, it becomes difficult to create an ambiguous space.

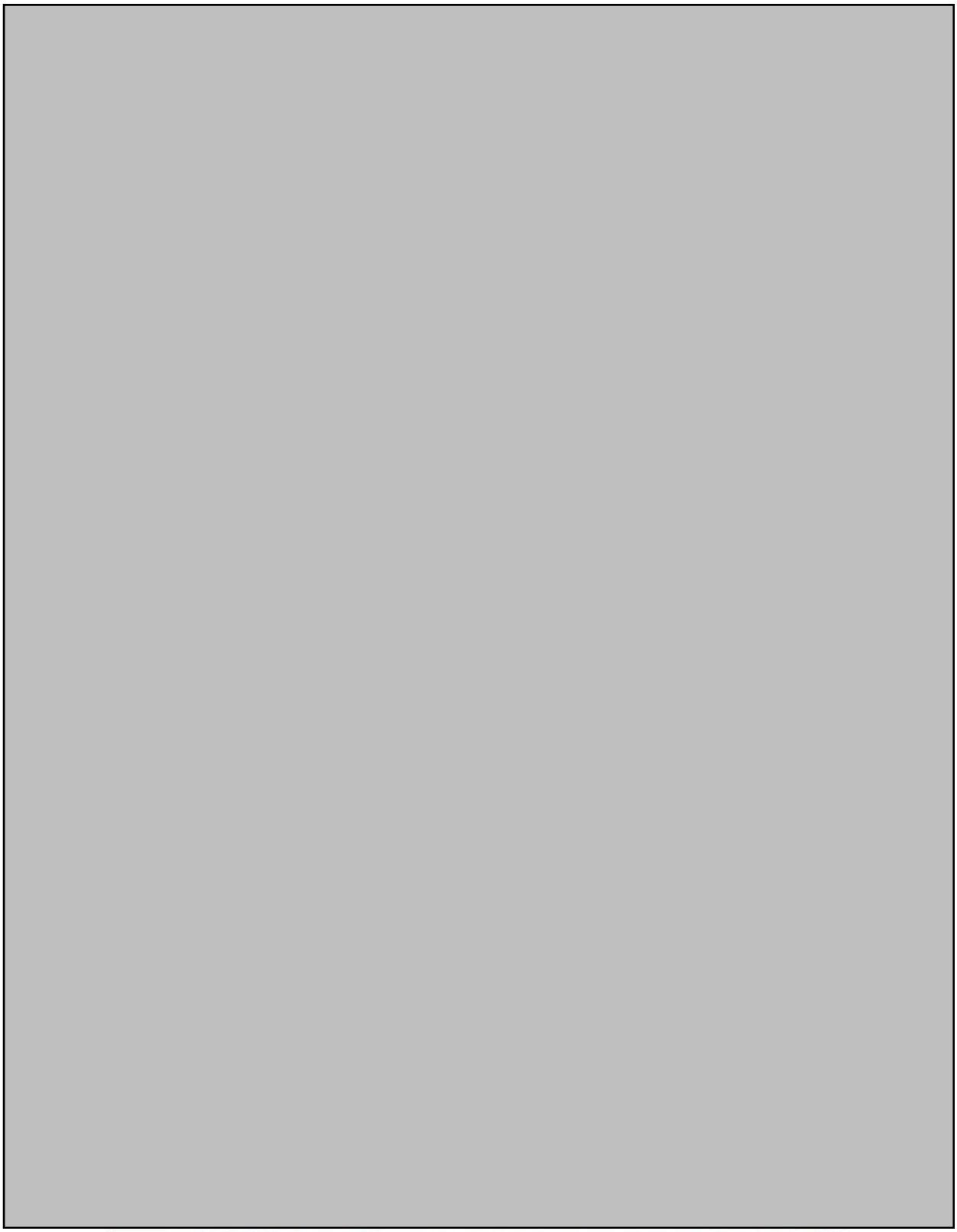


Figure 25: Columbia Medical Building (Source: DS+R)

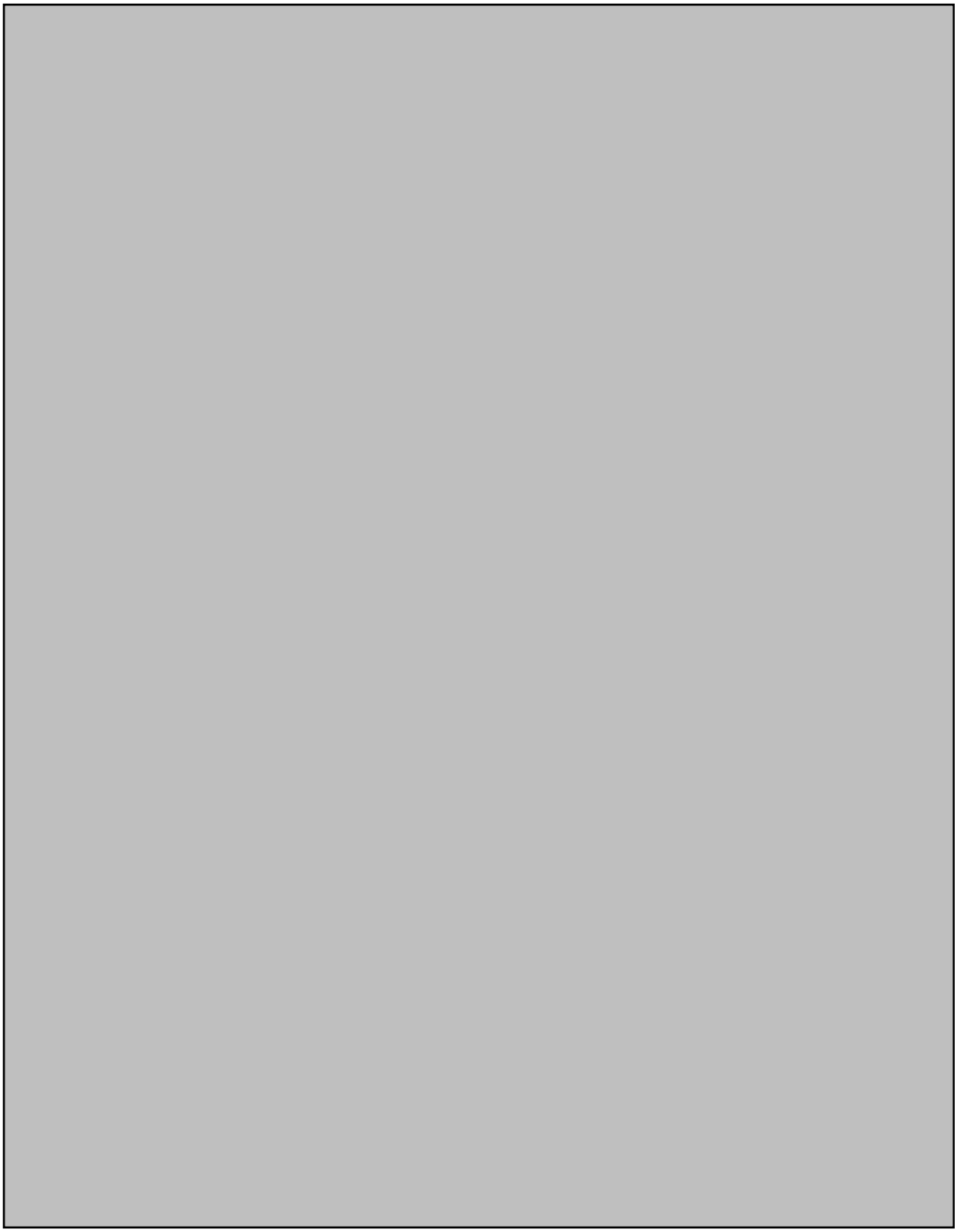


Figure 26: Columbia Medial Center Perspectives (Source: DS+R)

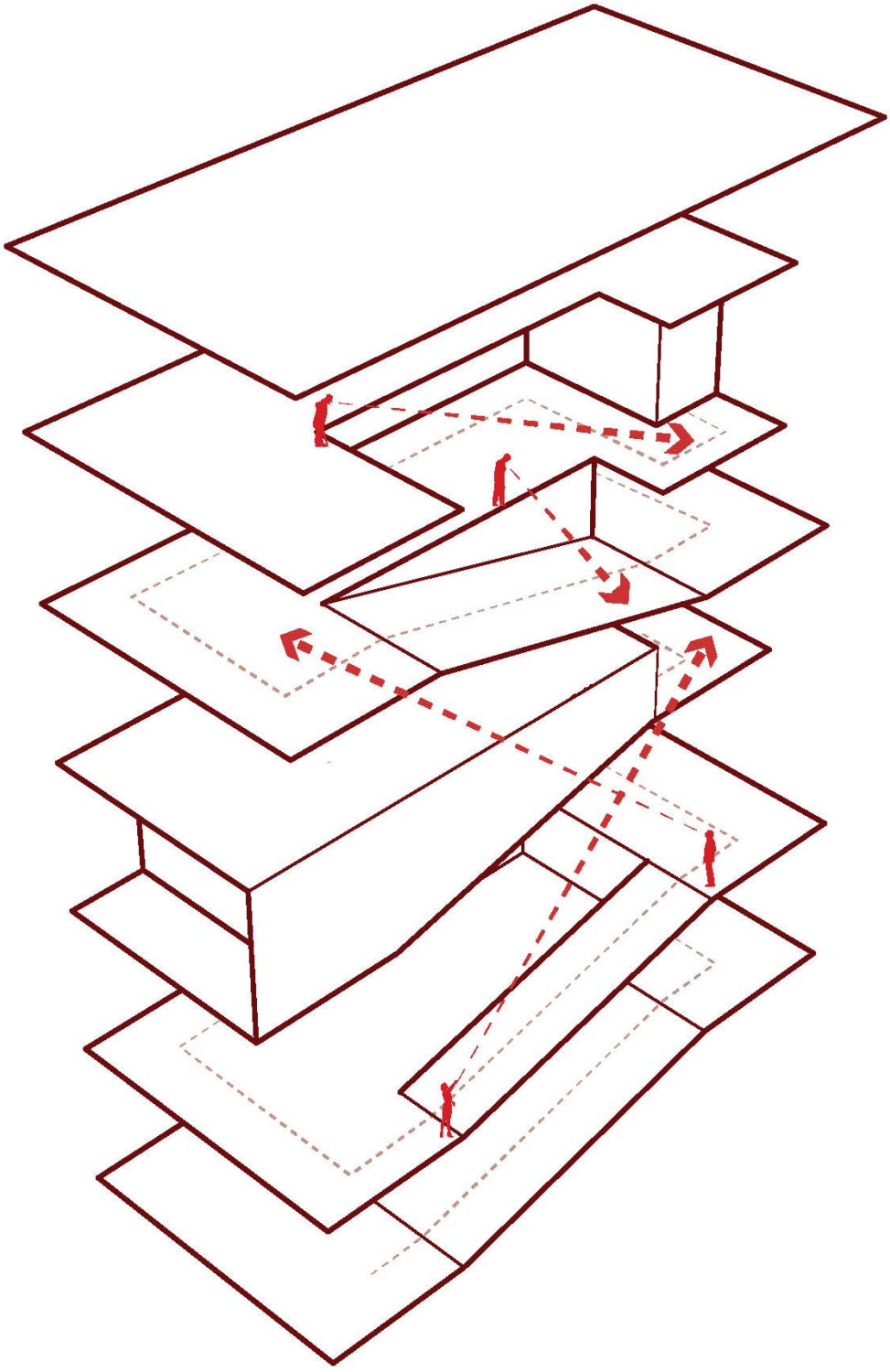


Figure 27: Floor interpenetration (Source: Author)

MUSEUM OF IMAGE & SOUND

Designed by Diller Scofidio + Renfro, the Museum of Image and Sound is a six-story museum building that houses an exhibition space, administrative areas, an auditorium, movie theater, and workshops, as well as restaurants and bars, designed for a Brazilian contemporary arts and education nonprofit organization.

Overlapping Spaces. The inspiration of the design comes from the adjacent boulevard fronting Copacabana beach designed by Roberto Burle Max in Rio de Janeiro, Brazil. A space of public motion, whether on foot, bike, or car, the concept is the extension of said boulevard, stretched vertically into the museum; gesturing towards inclusiveness by linking the outdoor and indoor, the public and private, through a vertical promenade that connects galleries, educational programs, and spaces of public leisure and entertainment[23]. The overlying of spaces translates to the interior design as well. The prominent space is organized around a central void with ramps and stairs connecting split-level exhibition space, projection gallery, retail spaces, and entertainment areas.

Urban Destabilization. The design by the architects of Diller Scofidio + Renfro did not put efficiency of space central. Instead, the organization of the promenade and interior spaces is an attempt to promote a vibrant atmosphere. The central void is designed to highlight the collection of artifacts within the museum, preventing it from becoming an artificial platform from which any program can be place. As a result the urban plan retains its rigidity and does not become a program of someone's aleatory whims.

[23] Diller scofidio renfro. "Museum of Image & Sound." Museum of Image & Sound | diller scofidio renfro. Accessed January 20, 2017. http://www.dsrny.com/projects/rio-mis.

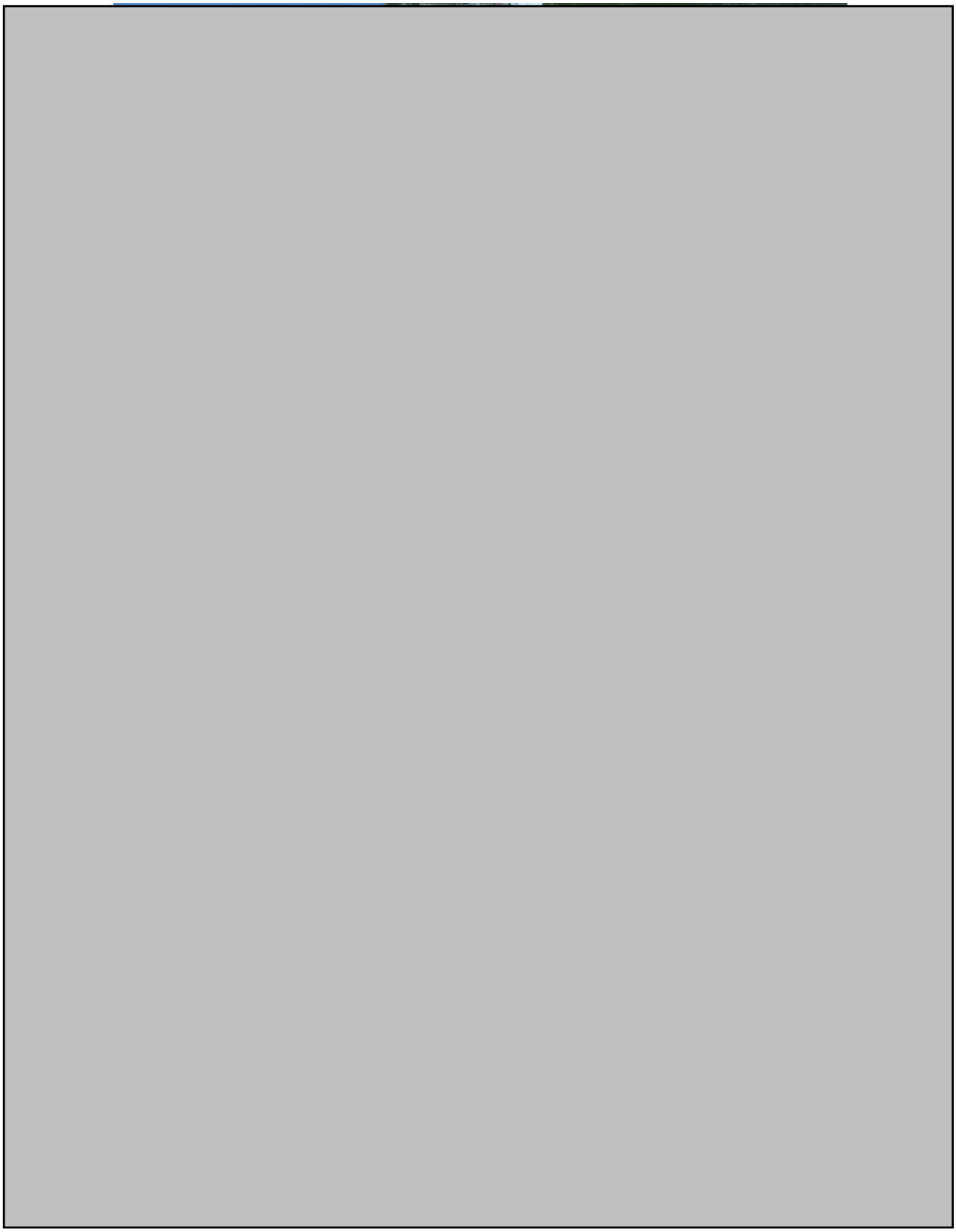


Figure 28: Museum of Image and Sound (Source: DS+R)

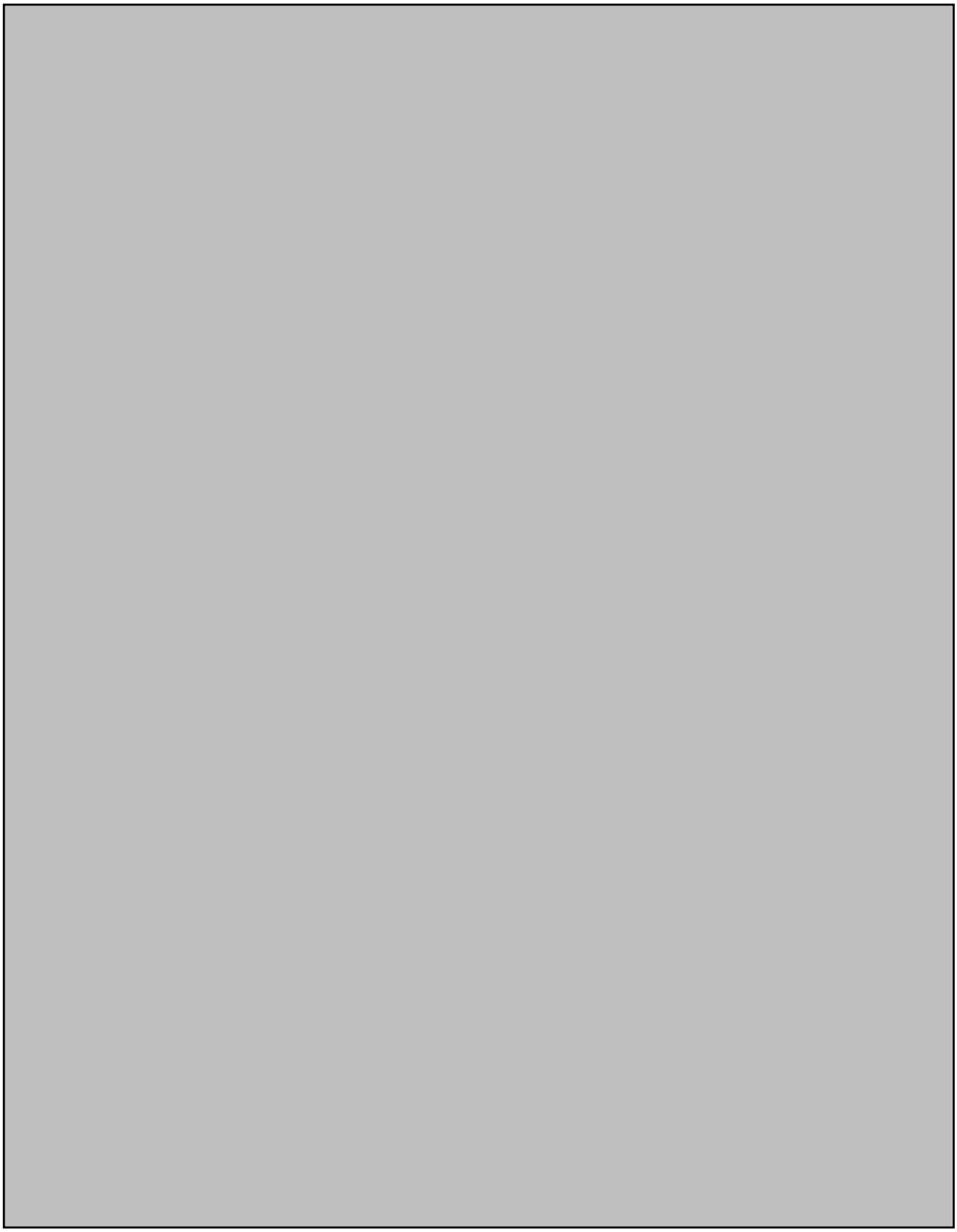


Figure 29: Museum of Image and Sound Perspectives (Source: DS+R)

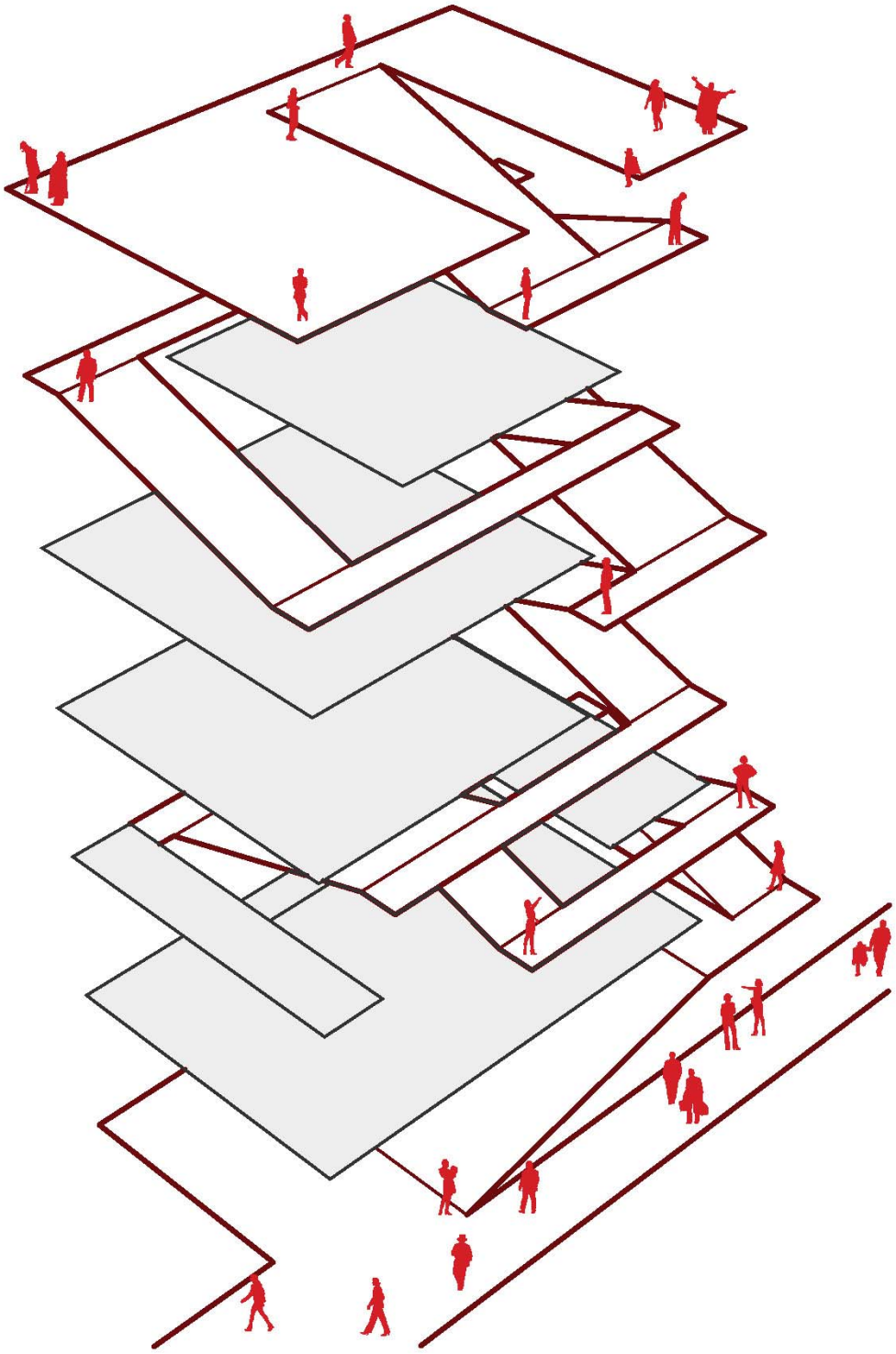


Figure 30: Street Connection and Circulation (Source: Author)

CHAPTER 5: CITY OF BROTHERLY LOVE

Due to a high-rise oriented thesis, density became an important factor in the location of a site. Within the Northeast district of the United States, three cities showed incredible potential for the development of the thesis; Washington, New York City, and Philadelphia. Washington's height constraints, the resulting necessity to build with concrete, and an inability to build underground, made it problematic to imagine a design that can contain the complex program envisioned by the thesis. On the other hand, Manhattan, New York's downtown, was already a well-established city; the ability to influence the growth and evolution became increasingly difficult. Philadelphia, with its modest downtown and increasing urban population became an ideal choice for the placement of the thesis.

William Penn, an idealistic Quaker, sought to create a society based upon religious tolerance and justice. Inspired by its Greek meaning, Penn named his new province Philadelphia in hopes of attracting those of universal spirits whose position was low in life[24]. From the beginning of its conception, Philadelphia had two distinct components; "a city with a formal plan to guide its growth and a surrounding countryside of agricultural settlement and country estates with no plan at all"[25]. Proposed by Thomas Holme, the city's first plan consisted of a grid of streets, with a major north/south (Broad) and east/west (Market) thoroughfare reaching both Delaware and Schuylkill River and present day Vine and Pine St. respectively. A public park is located in each of the four quadrants (Logan, Rittenhouse, Washington, and Franklin) with a municipal square,

[24] George B Tatum, *Penn's Great Town: 250 Years of Philadelphia Architecture Illustrated in Prints and Drawings* (Philadelphia: University of Pennsylvania Press, 1961), 17.
[25] John Andrew Gallery, *The Planning of Center City Philadelphia: From William Penn to the Present* (Philadelphia, Pa.: Center for Architecture, Inc., ©2007), 6.

which Penn hoped would be the location of the City Hall, on the intersection of the two major streets. Although the plan was only altered slightly as people began to settle, the expansion was not as predicted by Penn. First, Penn hoped the settlement would start at the two rivers and head inward through the east/west thoroughfare, adding significant value to his land. Instead, the importance of the Delaware port succeeded the plan and settlers settled east; not only causing the expansion to start at the port, but also head north and south along the coast causing a slow westward growth. Second, Penn did not see a need to establish a plan outside the city. He assumed, based on the pattern from England and Ireland settlements, that Philadelphia would always be surrounded by an agricultural countryside. As a result, the countryside consisted of huge tracts of agricultural land connected by an informal road system. Third, the lots divided by Penn and Holme and given to the early settlers, were too large, at times having a patch of forest segregating houses. Due to the flood of settlers, property owners started to subdivide the lots to build houses in order to rent them out; which provided the charming, narrow streets today. Failure to establish a growth plan outside the city's former borders left the progress to be determined by the developers. Due to the unyielding rigidity of Holme's gridded plan, institutions whose needs exceeded the plot sizes available within the city were forced to move to the outskirts; where available parcels were larger. Almost two hundred years later, the city became fragmented. The beginning of modern planning, enticed by the "White City" in 1893 Columbian World's Exposition, called for the inclusion of diagonal streets to connect important segments of the city; most notably Fairmont Park with City Hall[26]. The rise of City Planning and the numerous

[26] John Andrew Gallery, *The Planning of Center City Philadelphia: From William Penn to the Present* (Philadelphia, Pa.: Center for Architecture, Inc., ©2007), 20-23.

investments from wealthy individuals towards the progress of the city, created the vibrant and diverse city known as Philadelphia.

Today the city that has become the economic, cultural, and educational anchor of the Delaware Valley. With a population of 1.5 million, it is the largest city in the Commonwealth of Pennsylvania and it's downtown, City Center, is the second most populated in the United States; and it is still rising. The City center alone accounts for 42% of the city's new jobs attracted between 2010 and 2014, and 25% of the new residents to the city. Led by millennials and empty-nesters drawn by the diverse employment, educational., cultural, and dining opportunities concentrated in the downtown; causing the city to transform into a thriving, mixed-use setting for business, innovation, education, cultural and civic activity. Developers have noticed and kept pace with the demand. The development of Philadelphia has grown inward; enabling the development of numerous high-rise buildings along Market Street with 27.8 million square feet of development costing 8.5 billion. By 2017, 5600 new housing units will be completed due to an increase of 12000 jobs by the universities and medical institutions. Philadelphia's transportation systems, robust in subway and bus, make these jobs accessible to residents across the region while bikeshare stations have enhanced downtown into a bicycle-friendly environment[27]. Philadelphia, however, is still a relatively young city. Still in search of its identity among the world's prominent cities, Philadelphia's growth is bound to expand past its current downtown borders, expanding along with it the presence of its high-rise buildings. Its density, accessibility, and cultural diversity makes it an ideal location for the exploration of this thesis.

[27] Paul Levy, *State of City Center 2016* (Philadelphia, PA: 2016), 2-6. 51-71.

THREE POTENTIAL SITES

Rittenhouse Square. Site A is anchored by Rittenhouse Square, one of the five original parks planned by William Penn, and Broad Street. Located near the intersection of Walnut St. and S 20th, the site is in the premier shopping districts of City Center; it is home to several high-end stores, upscale dining restaurants, and historic cultural centers. Although small, about 13,000 square feet, it sits in the middle of the most desirable locations in downtown. High-rise residences, luxury apartments, office towers, surround a tree-filled park, which offers an oasis of respite and relaxation amongst the bustling city.

Chinatown. Settled by Cantonese immigrants in the mid-19th century, site B is situated in the tip of Philadelphia's Asian enclave and the heart of the business district. A large site, about 23000 square feet, it has a significant presence in the business district and its direct connection to the Pennsylvania Convention Center, at the intersection of Arch Street and 13th, exposes the site to a high level of pedestrian transit.

Market East. The Market East neighborhood serves as a gateway to the city's business, shopping, and entertainment district. Unlike the other neighborhoods of Center City, Market East is largely commercial and has little residential development. Site C, located at the intersection of Market and 8th, is surrounded by low-rise buildings allowing ample light to penetrate deep into the site. At about 62000 square feet, site C has an immense opportunity to influence one of the major thoroughfares of Philadelphia. The site is also situated at the intersection of two prominent subway lines, Market- Frankford and PATCO. The station, therefore, has an incredible access to the underground pedestrian concourse.

SITE CRITERIA

Density. As stated before, the foundation of the thesis is dependent on the density of the site. The choice of City Center, as opposed to other locations within Philadelphia, is due to the continual rise in population and thus, the continual rise in development. With the scarcity of space, developers are building taller to respond to the flood of new residents. Without density, the necessity of the high-rise building would be non-existent. Without a high-rise building, the ability to overlap disparate programs becomes difficult. The manipulation of the slab, used to separate different floors, is an easier task to explore, within this thesis, than attempting the same concept over streets and roadways.

Analysis. The three potential sites are all located in the heart of Philadelphia's downtown. Within Center City, however, there are areas that are denser than others. Rittenhouse Square is in the premier shopping street and contains the most coveted addresses. Surrounded by a popular park encompassed by luxury apartments and hotels, it ranks the highest in density. Chinatown, although in the heart of the business district, lacks the necessary residential buildings near the site to keep it from looking uninhabited at night. Market East lies as the medium between the two sites. Although it does not contain the residential buildings, it has numerous museums and restaurants to keep the nightlife active.

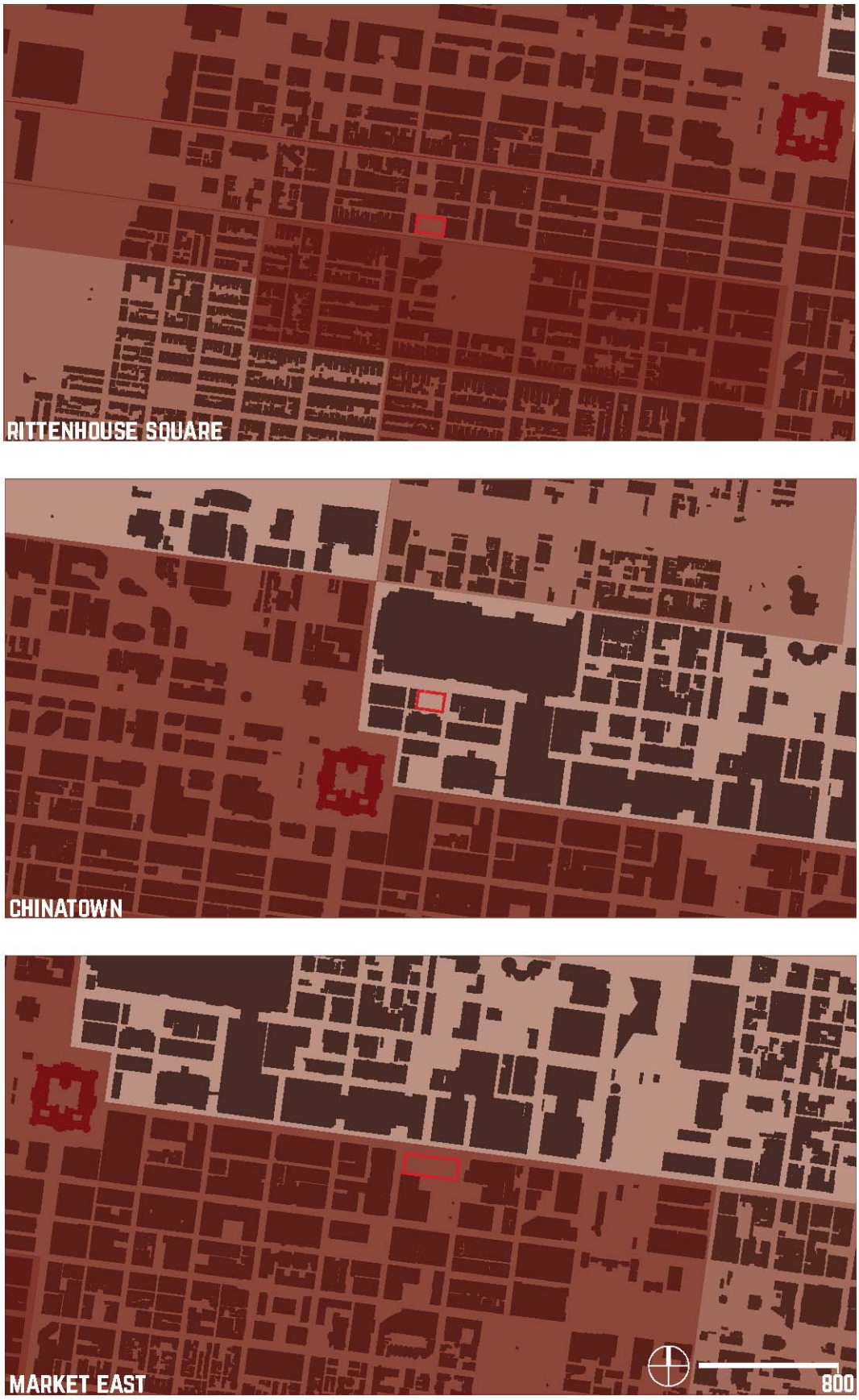


Figure 31: Density (Source: Author)

Diversity. From the time of birth, a person is exposed to a culture dictated by to the world they were born in. How they perceive reality is therefore seen through the those lenses. This means that the meaning of an object, its beauty, its function, its desirability is determined through that lens; it is not innate. Two people, with different backgrounds, can look at the same object, without it changing, can come to two different conclusions. What this thesis aims to do is engage that cultural lens through architecture; relying heavily in an element that the architect cannot control, the people. It is essential that the site be diverse in its demographic. Without, the object, in this case the architecture, will be seen with the same or similar lens.

Analysis. Although not the most diverse downtown in the United States, City Center is higher than most. With a population consisting of 62% Caucasian, 24% African American, and 9% Asian, Philadelphia placed 167th with a score of 51.16 when considering factors such as social class, ethno-racial diversity, and economic diversity[28]. Similar to density, the City Center has areas within that have varying degrees of diversity. Rittenhouse Square, a favorable place to live, is populated by mostly wealthy, upper-class residents; favoring the 62% Caucasian population. As you move eastward, the downtown begins to resemble more the overall diversity of Philadelphia. The Chinatown and Market East sites fall under the similar diversity scores but the Chinatown site comes ahead because its surrounding context.

[28] Bernardo, Richie. "2016's Most Diverse Cities in America." WalletHub. Accessed January 15, 2017. https://wallethub.com/edu/most-diverse-cities/12690/, 1

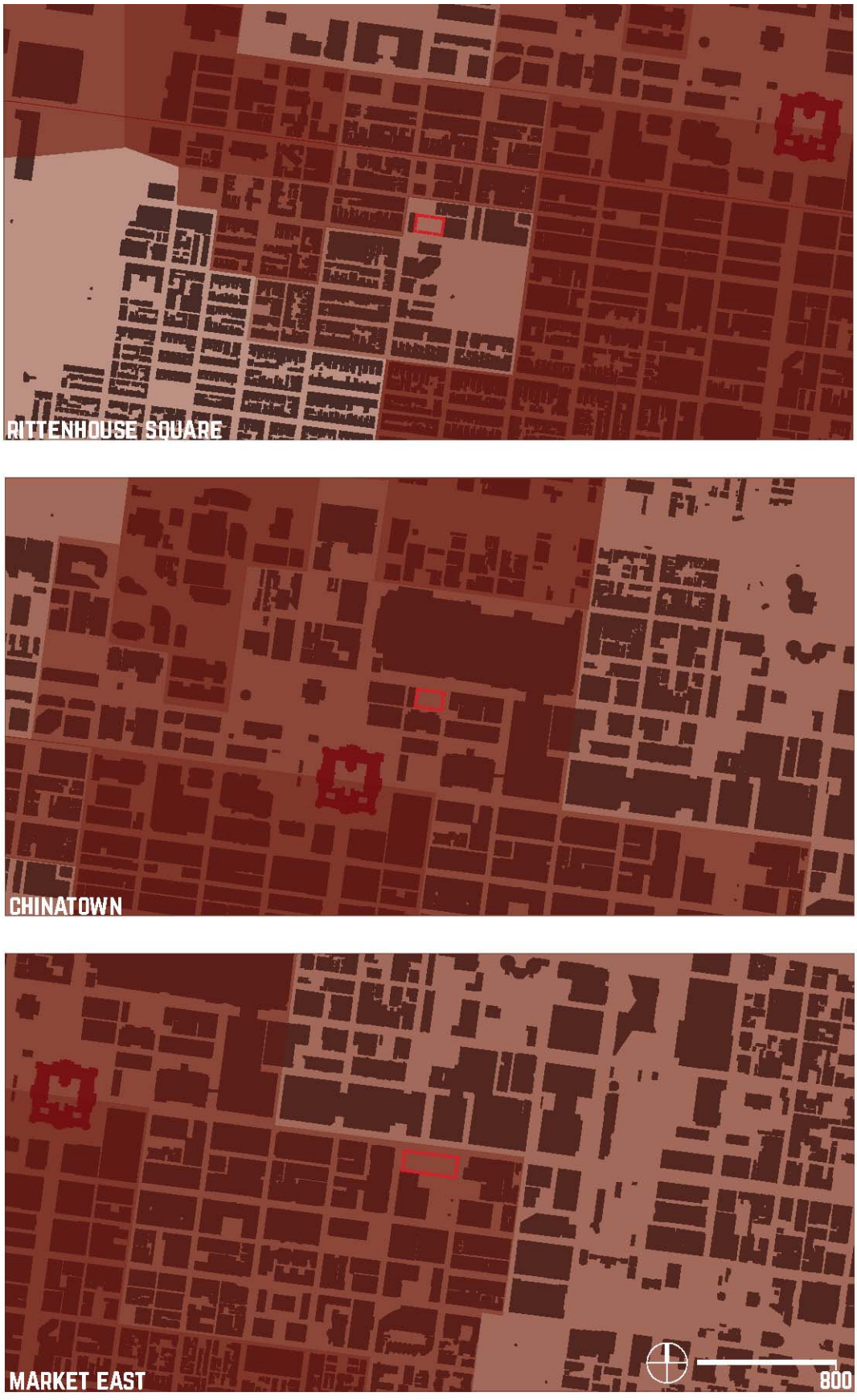


Figure 32: Diversity (Source: Author)

Accessibility. As a city continues to grow, the need for an effective public transportation systems increases. Philadelphia has an extensive transportation system to accommodate the continuing increase in density; including bus, trolley, metro, and bikeshare systems. Access to one, or any, these systems allows the thesis to integrate into Center City; an extension of the downtown instead of an addition. Unique to Philadelphia, residents can navigate most of the downtown through an underground, pedestrian concourse. A site with direct access to an existing concourse network validates the exploration of building downwards, destabilizing the ground plane, and emphasizes the verticality of the project.

Analysis. The size of City Center, from east to west, is about two miles. With an extensive bus system, all parts of the downtown are accessible for pedestrians. Where they differ is in their access to the metro and pedestrian concourse. Rittenhouse Square is the least accessible site. Four blocks from the nearest metro station, reliance on bus transport and walking is necessary. Chinatown is in the heart of the downtown; next to city hall. It has access to several metro stations within a ten-minute walking radius. Market East however surpasses the other sites because of its direct access to two metro lines and the pedestrian concourse within the 8th Street Station.

Figure 33: Transportation (Source: Author)

Natural Light. Light, as a type of architectural element, has been used to define space; not to create boundaries and segregate zones but to romanticize, glamorize, idealize the sense of the place. Light then can be used as a tool; to be manipulated, articulated, and designed to favor the architect's intentions. The availability consequently becomes crucial to this thesis. With six different programs, the significance of natural light varies from one to the other; sometimes within the same program. An ideal site therefore must be exposed; not just to bathe the building in sunlight but to allow freedom in the overall configuration of the design. The site becomes extremely difficult to find in a dense downtown vital, however, to the success of the program(s).

Analysis. The scarcity of open land to build on is great in any downtown; trying to find one that has daylight access within that downtown is even greater. Due to City Center's extensive development, there are only a few sites that can accommodate both. From the three potential sites, only one has ample direct sunlight. Both Rittenhouse Square and Chinatown are surrounding by high-rise buildings; making them difficult sites to work with. Rittenhouse square, because of a historically preserved church, allows a greater amount of sunlight to penetrate through. Market East however surpasses both sites. Due to low-rise buildings towards the south and the sheer size of the lot, ample amounts of sunlight penetrate deep into the site.

Figure 34: Shadow Study Morning (Source: Author)

MARKET EAST

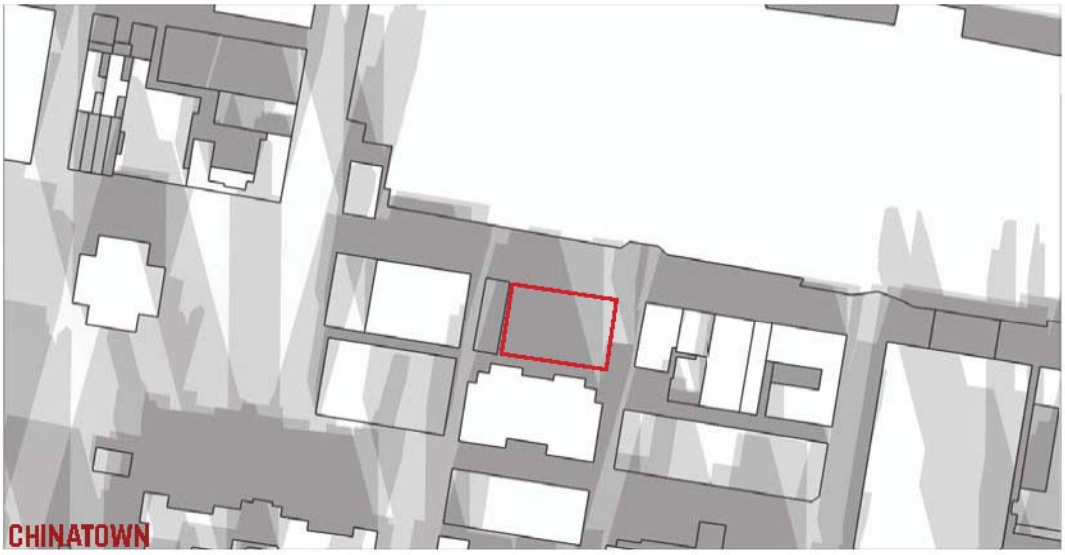
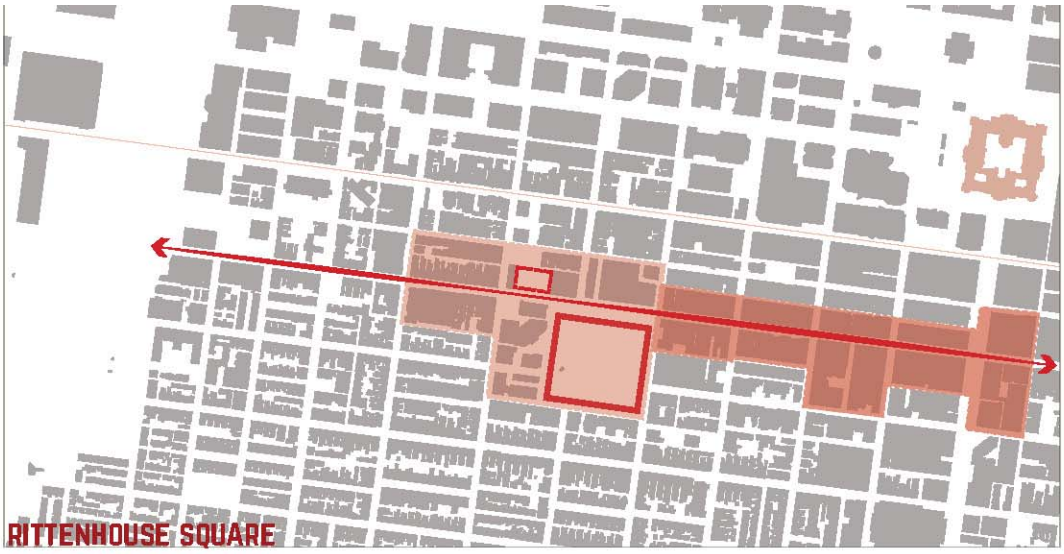


Figure 35: Shadow Study Afternoon (Source: Author)

Figure 36: Shadow Study Evening (Source: Author)

Location. City Center is the most vibrant and culturally diverse part of Philadelphia; it is where the location of this thesis makes the most sense. Within the bounds however, there are sites that better support the program than others. For example, with six different programs within this proposed building, it is a benefit to have a site with amenities that can help enhance and diversify the area. Being close to the heart of the city, close to the vibrancy, to the greenery, the activity, and diversity become an asset to making the thesis an extension of the public realm instead of just another addition.

Analysis. City Center is a walkable downtown. With a walk score of 78, all the major landmark and tourist sites are in walking distance. Rittenhouse Square, located within both the residential district, shopping district, and proximity to Rittenhouse square park, surpasses the other two in location. Chinatown site's location within the business district and direct connection to the Convention Center and proximity to City Hall places it second. Market East, although the furthest from City Hall and the heart of Center City, it lies within a five-minute walk to Independence Hall. As development rises on Market Street, the site will rise in density and popularity.



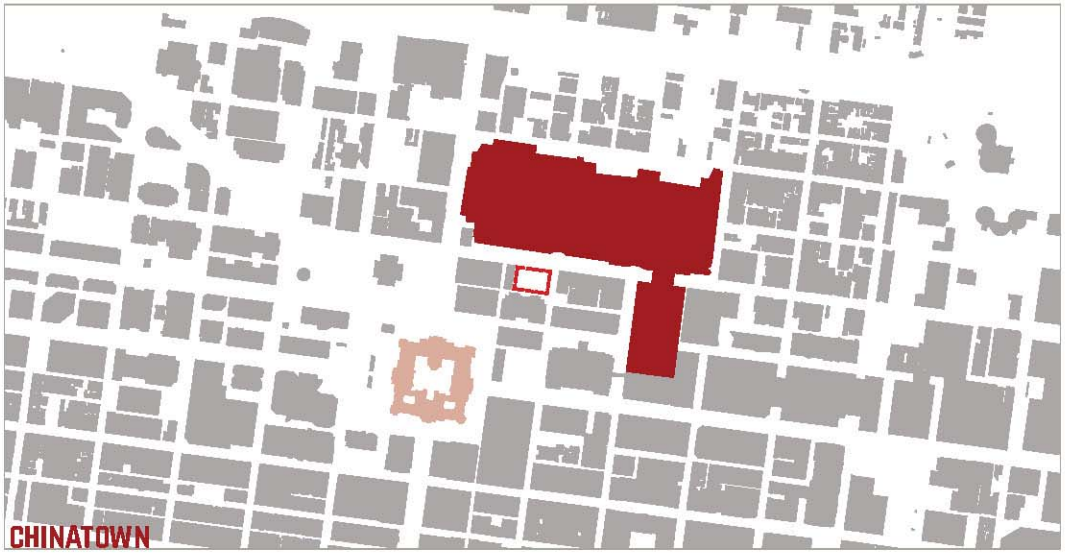


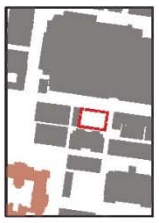
Figure 37: Location (Source: Author)

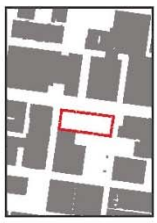
MARKET EAST

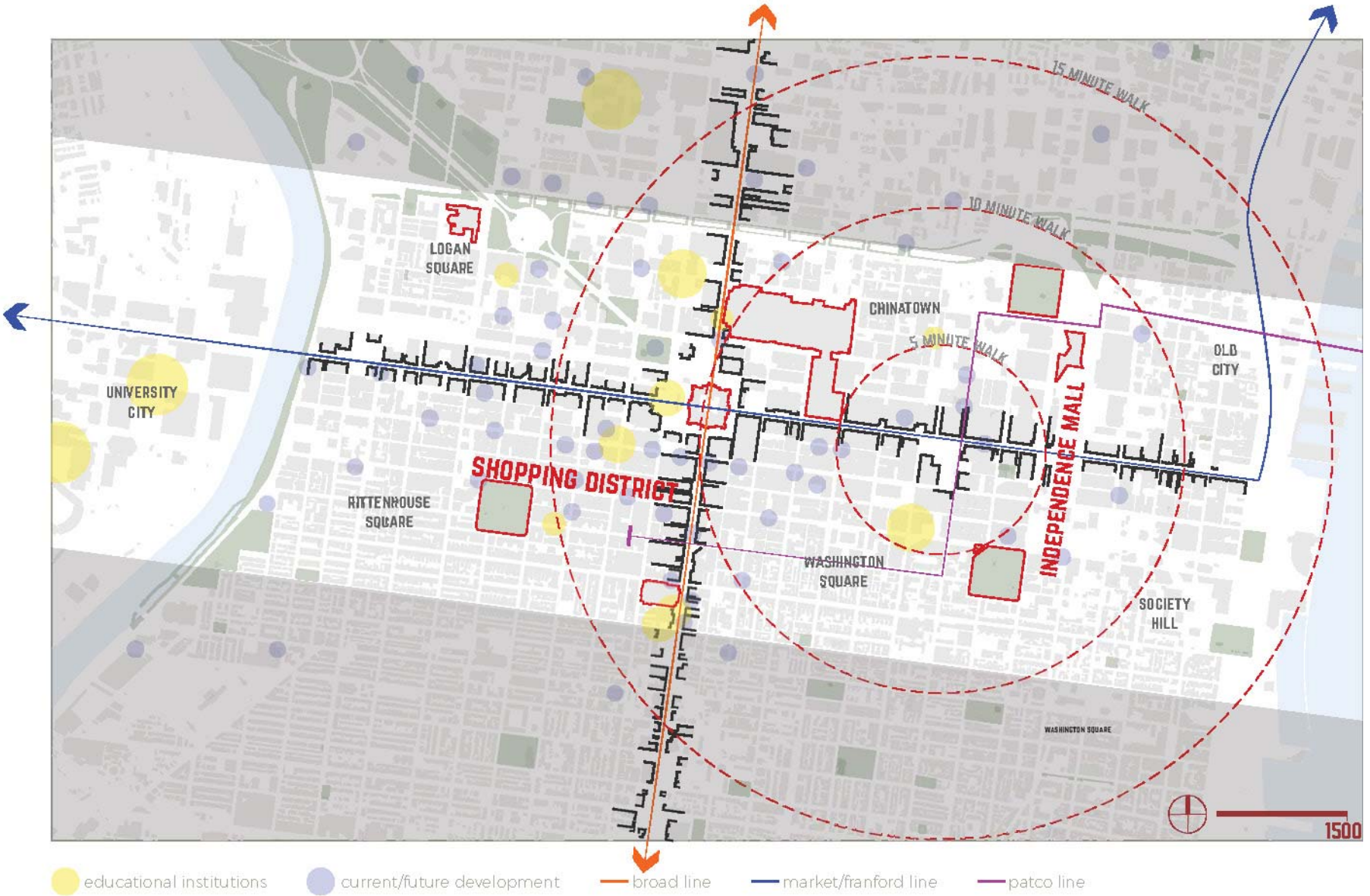
SITE SELECTION

Market East is the chosen site. As the gateway to the commercial and business district, Market East attracts a culturally diverse pool of people. The site is located on Market Street, the major east/west thoroughfare, between City Hall and Independence Mall. Current and future development ensures future density and 8th St & Market metro station, located across the street, allows ease of access. Ample light is beneficial for multiple programs, making Market East an ideal site for the exploration of a conceptual high-rise design.

	RITTENHOUSE 12,740 SQ. FT.		CHINATOWN 22,755 SQ. FT.		MARKET EAST 62,080 SQ. FT.	
DENSITY /30	4	several high rise residential units and luxury apartments surround Rittenhouse Square	4	center of the business district with several high rise office buildings	4	mix of residential and office buildings located between City Hall and Independence Mall attracting multiple tourists
DIVERSITY /25	4	low diversity index with mostly caucasian residents	2	slightly higher diversity index	5	high diversity index with a mix of black, white, and small amount of hispanic residents
ACCESSIBILITY /20	2	ample bus routes with a metro stop a few blocks away	3	center of the business district with access to multiple metro stops as well as bus routes	5	metro access directly across adjacent street with direct connection to the underground pedestrian concourse
NATURAL LIGHT /15	5	historic church toward the south enables light to pass through	3	commercial office building blocking southern exposure from the sun	4	low density buildings surround the site enabling light exposure from all directions
LOCATION /10	2	located in the premier shopping district adjacent to Rittenhouse Square, a well established green space	3	directly across the Pennsylvania Convention Center with proximity to City Hall	4	In between City Hall and Independance Mall along Market Street, premier commercial district
TOTAL	17		15		22	






15 MINUTE WALK
10 MINUTE WALK
5 MINUTE WALK
LOGAN SQUARE
CHINATOWN
OLD CITY
UNIVERSITY CITY
SHOPPING DISTRICT
INDEPENDENCE MALL
RITTENHOUSE SQUARE
WASHINGTON SQUARE
SOCIETY HILL
WASHINGTON SQUARE
1500
educational institutions
current/future development
broad line
market/franford line
patco line

DESIGN APPROACH

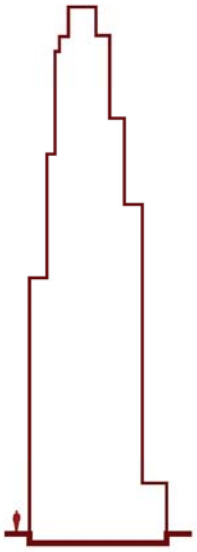


Figure 38: High-Rise Concept 1 (Source: Author)

The modern high-rise building is perceived as one whole entity; an object in the built environment. That perception is achieved by the methods used to clad the building. Using similar materials and similar forms, the façade of the building gives it a cohesive impression. It however is not.

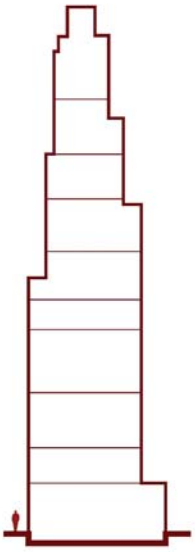


Figure 39: High-Rise Concept 2 (Source: Author)

A typical high-rise building has many levels usually taking the same size as the plot of land it stands on. As stated earlier, these levels are disjointed and lack the connectiveness expressed on the urban, horizontal plane. As a result, the high rise building can contain an infinite number of levels, realms, programs, or worlds.

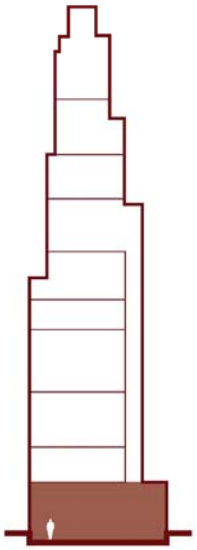


Figure 40: High-Rise Concept 3 (Source: Author)

When walking through and experiencing the high-rise building however, it only allows the person to interact with a few components of it. The lobby, as the diagram above illustrates, is the least private world and the world that most of the visitors interact with.

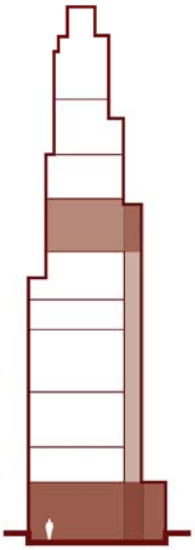


Figure 41: High-Rise Concept 4 (Source: Author)

For the people who live and work within that building, they only interact with two more components; the elevator and their destination floor. The elevator, one of the inventions that make high-rise buildings plausible, has removed the need to interact with the floors in between, above, and below. This diagram however lies.

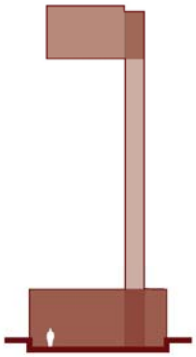


Figure 42: High-Rise Concept 5 (Source: Author)

This diagram above better portrays the experience of living and working in a high-rise building. The only elements you experience deal with the entrance, the vehicle by which you arrive at your floor, and your destination.

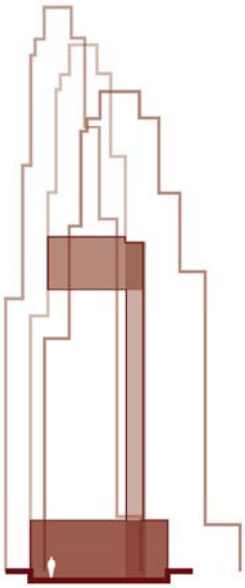


Figure 43: High-Rise Concept 6 (Source: Author)

Even though you can see the envelope of the building with outside; the disconnection between the interior and exterior doesn't allow you to place yourself within the building through the façade. When inside, you have a vague semblance of the size of the building but never a true idea.

Figure 44: High-Rise Concept 7 (Source: Author)

This is reminiscent of suburbia. The different houses and buildings act as the different levels of a high-rise building.

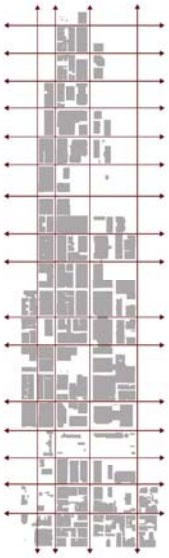


Figure 45: High-Rise Concept 8 (Source: Author)

The corridors the separate the different programs then are used as corridors of travel; much like the elevator. The dissasocation from the evnironment as you travel by car through a suburban community is very similar to the disassociation experienced when traveling between floors in an elevator.

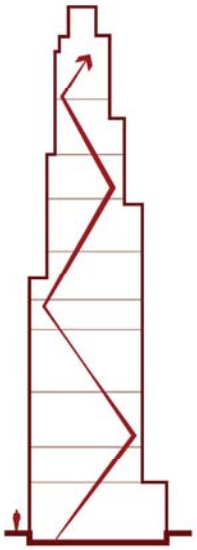


Figure 46: High-Rise Concept 9(Source: Author)

What if we can reshape the model of the high-rise building. Instead of segregating the upper floors from the public, a path is created through the floors in order for the public to benefit from the views of the city.

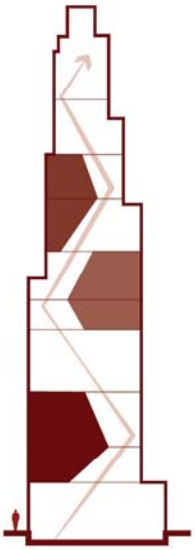


Figure 47: High-Rise Concept 10 (Source: Author)

Along that public promenade, a variety of program can be present to attract the public towards the top; restaurants, bars, and retail spaces just to name a few. The remainder of the spaces can be designated to traditional offices and apartments.

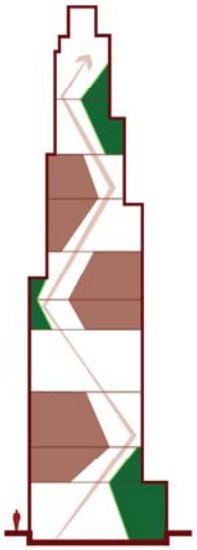


Figure 48: High-Rise Concept 11 (Source: Author)

In addition to the series of diverse programmatic elements, a series of public spaces that tie with the promenade are should be present to lessen the burden of walking a great number of stairs.

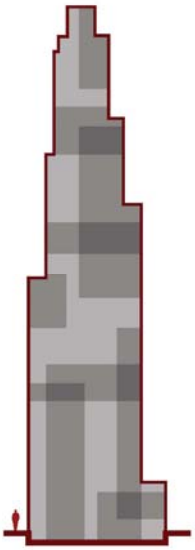


Figure 49: High-Rise Concept 12 (Source: Author)

The end results are a series of spaces that coalesce to create spaces that are ambiguous, undefined, and new.

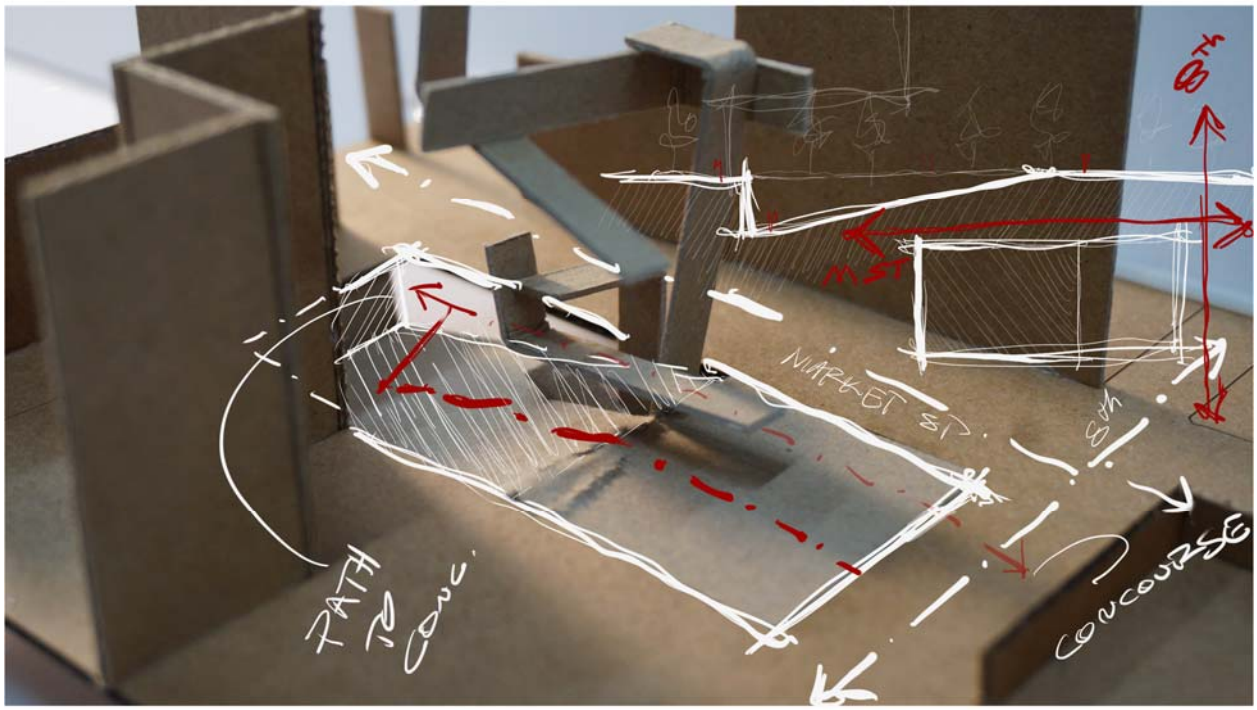


Figure 50: Model Diagram 1 (Source: Author)

When looking at the site, one of the first strategies was to slant the plaza level towards the public pedestrian concourse below. This allows the building to be integrated within the fabric of the city. The building is also slanted towards the west. Although unnoticeable to the naked eye, the site slopes down to both rivers on either side. To correct the perception of flat terrain, the building's slant helps emphasize that slope.

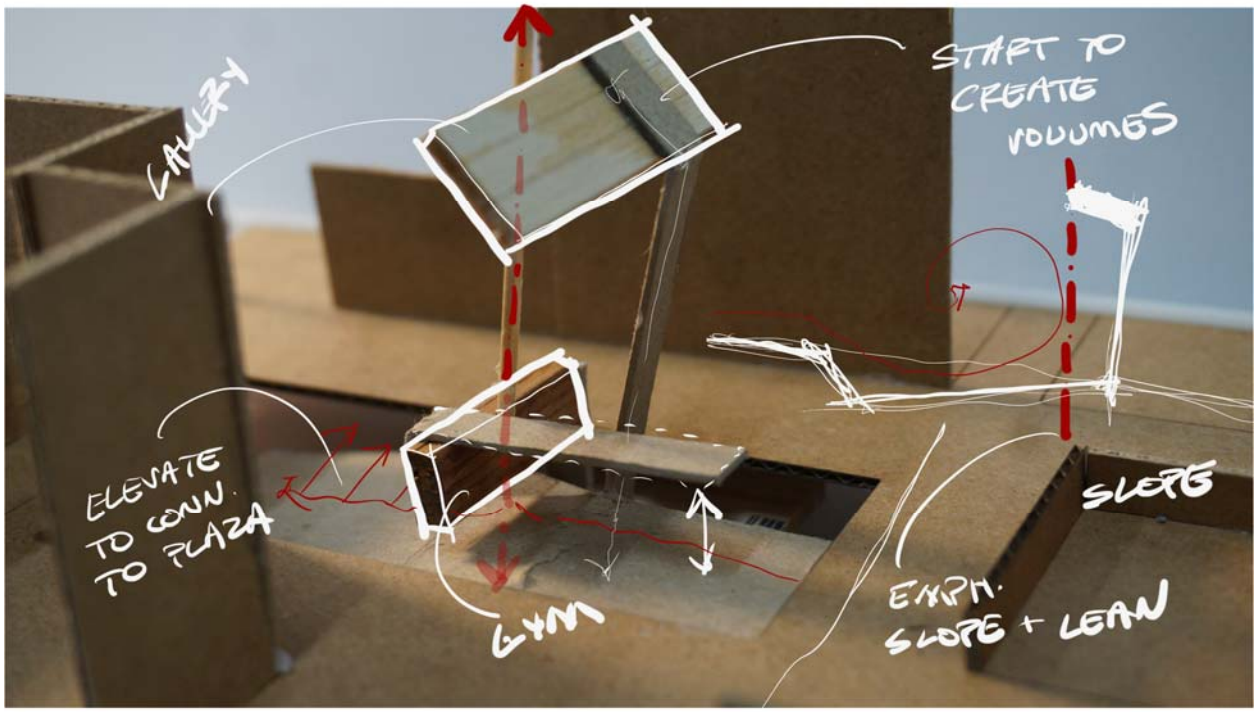


Figure 51: Model Diagram 2 (Source: Author)

Once the building was integrated within the fabric of the city, different volumes needed to be created to house each of the programmatic elements. In this diagram, the gallery is situated at the top while the gym and church are situated towards the bottom with the office and hostel filling the space in-between. Some of the design strategies include introducing a vertical element to further emphasize the lean of the building. In order for the street to be connected to the building and plaza, the church is elevated to allow clear connection from the plaza to the underground concourse.

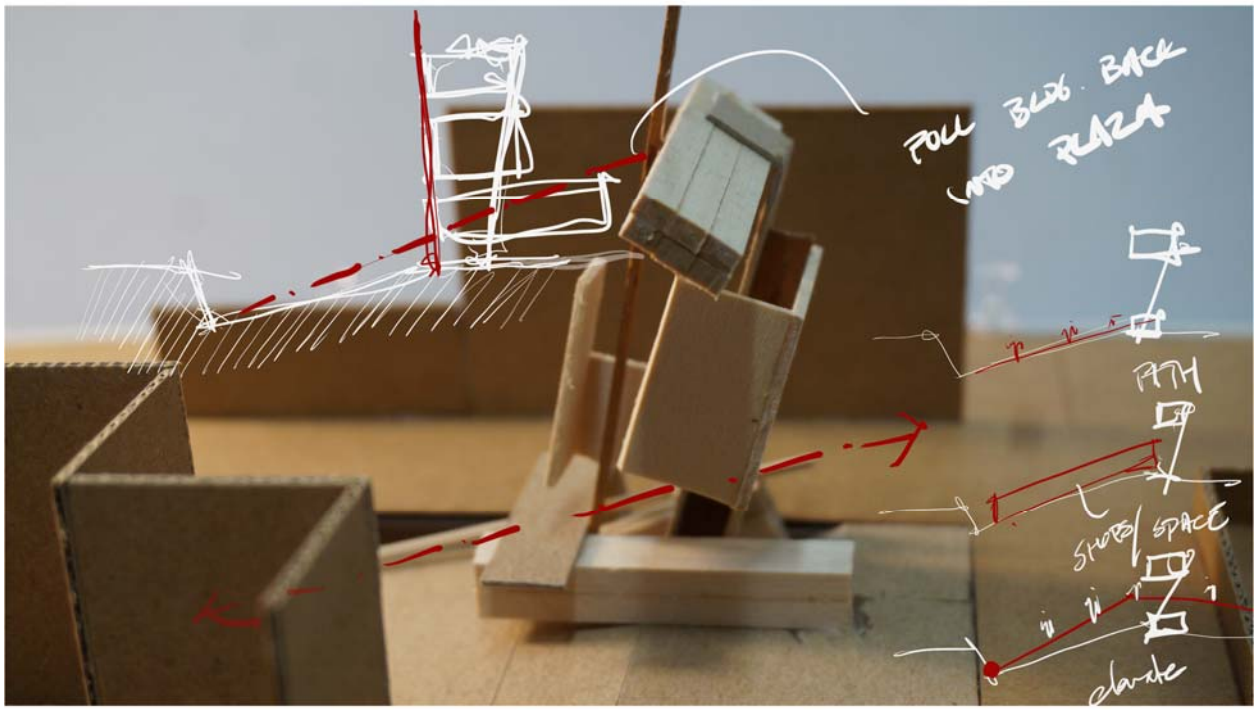


Figure 52: Model Diagram 3 (Source: Author)

As the model gets developed with more program, certain spaces need to be enclosed to create interior, usable spaces. As a result, the mass of the building started to pull back from the plaza creating two different things instead of one whole composition. In order to retain the cohesivenes, a rod was inserted to pull those pieces together.

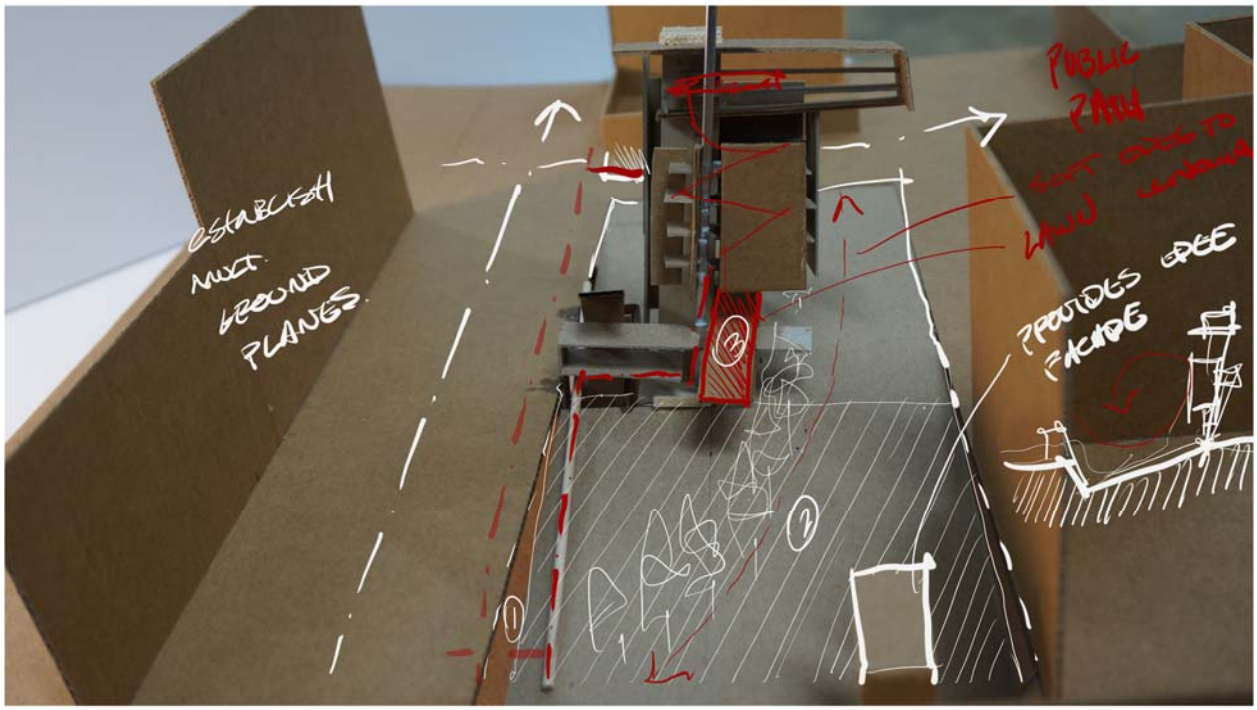


Figure 53: Model Diagram 4 (Source: Author)

As a result, the thesis tries to create a multitude of public levels. This is achieved by first recognizing the two existing levels within the city, the underground concourse and the street level. Then creating a few more levels for the public to inhabit on top of those by the use of elevators, stairs, escalators, and ramps.

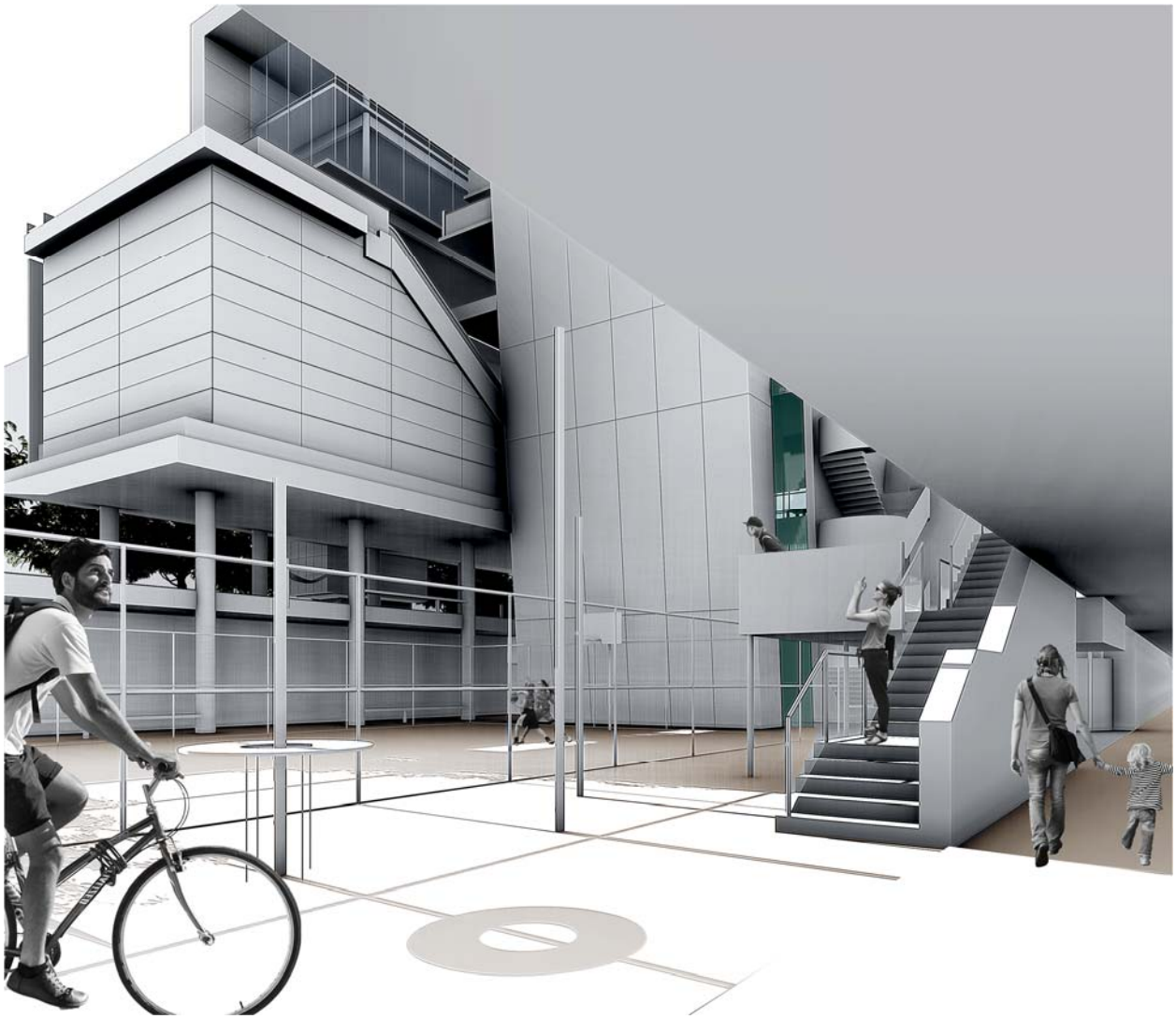


Figure 54: Basketball Court (Source: Author)

Figure 55: Plaza (Source: Author)

Figure 56: Lawn (Source: Author)

Figure 57: Stadium (Source: Author)

BIBLIOGRAPHY

Beedle, Lynn S., Mir M. Ali, and Paul J. Armstrong. *The Skyscraper and the City: Design, Technology, and Innovation*. Lewiston: Edwin Mellen Press, ©2007.

Bernardo, Richie. "2016's Most Diverse Cities in America." WalletHub. Accessed January 15, 2017. https://wallethub.com/edu/most-diverse-cities/12690/.

Craik, Kenneth J W. *The Nature of Explanation*. Cambridge: Cambridge University Press, 1967.

Diller scofidio renfro. "THE ROY AND DIANA VAGELOS EDUCATION CENTER." COLUMBIA UNIVERSITY VAGELOS EDUCATION CENTER | diller scofidio renfro. Accessed January 20, 2017. http://www.dsrny.com/projects/columbia-medical-center.

Diller scofidio renfro. "Museum of Image & Sound." Museum of Image & Sound | diller scofidio renfro. Accessed January 20, 2017. http://www.dsrny.com/projects/rio-mis.

Gallery, John Andrew. *The Planning of Center City Philadelphia: From William Penn to the Present*. Philadelphia, Pa.: Center for Architecture, Inc., ©2007

Geertz, Clifford. *The Interpretation of Cultures: Selected Essays*. New York: Basic Books, ©1973.

High-Rise Security and Fire Life Safety. utterworth-Heinemann: B, 2003. Accessed January 18, 2017. http://public.eblib.com/choice/publicfullrecord.aspx?p=294611.

Koolhaas, Rem. *Delirious New York: A Retroactive Manifesto for Manhattan*. new ed. New York: Monacelli Press, 1994.

Landau, Sarah Bradford, and Carl W. Condit. *Rise of the New York Skyscraper, 1865-1913*. New Haven: Yale University Press, 1999.

Leach, Edmund Ronald. *Culture and Communication: The Logic by Which Symbols Are Connected*. Themes in the Social Sciences. Cambridge: Cambridge University Press, 1976.

Leach, Neil, ed. *Rethinking Architecture: A Reader in Cultural Theory*. New York: Routledge, 1997.

Levy, Paul. *State of City Center 2016*. Philadelphia, Pa: 2016.

McShine, Kynaston, and Dawn Ades, eds. *Joseph Cornell*. New York: Museum of Modern Art, ©1980.

Tatum, George B. *Penn's Great Town: 250 Years of Philadelphia Architecture Illustrated in Prints and Drawings*. Philadelphia: University of Pennsylvania Press, 1961.