ABSTRACT

Title of Document:	BOUNDARY CAMPUS THRESHOLD: URBAN UNIVERSITY CAMPUS BOUNDARIES
	Gina Maria Fernandes, Master of Architecture, 2016
Directed By:	Professor Matthew Bell, Architecture Program

University campuses, located in urban settings, develop specific characteristics based on the urban fabric around them. As universities meet their physical, political, and social campus boundaries, they must decide how to progress. University stakeholders, from students & faculty to neighbors & alumni, engage the campus edge as they traverse between city and campus. Thus, the campus edge becomes a physical manifestation of overlapping and interconnected stakeholder identities.

BOUNDARY CAMPUS THRESHOLD
URBAN UNIVERSITY CAMPUS BOUNDARIES

By

Gina Maria Fernandes

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
Master of Architecture
2016

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Dedication

I would like to dedicate this thesis to the group of Architecture 400 students I instructed in Fall 2015. Without knowing it, they gave me the motivation and strength I needed to work on my thesis during an incredibly challenging time in my life. The passion, determination, and curiosity they brought to their work fueled me and gave me hope that I, too, could conquer that, which seemed impossible to me. I will forever be grateful for their friendship and (unknowing) support and I cannot wait to see the amazing things they create in their lifetime.

To my Gina Strong Section… Thank you.

Acknowledgements

Hansel Bauman, University Architect at Gallaudet University welcomed me into the Gallaudet community and opened up the University's design process to me. I am grateful for all he has taught me about DeafSpace and I hope to continue to learn from him in the years to come.

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Chapter 1: Introduction

Section 1: Introduction

The longevity of a university comes from three types of planning: academic, institutional, and physical. Each intertwines with the other, collectively strengthening the success and survival of a university. Institutional planning outlines the strategic mission of a university through the recognition of its historical founding and a vision for maintaining the prestige and prosperity of the school for decades, if not centuries, into the future. The academic plan focuses on the 'bread and butter' of a university, or how the institution will disseminate knowledge to a new generation and foster research that supports the betterment of the world. Physical planning or campus planning provides the spaces for academic and institutional planning to thrive and protects the 'home and hearth' of the institution.

A university benefits from using a campus plan and the architecture of its campus to support its academic and institutional mission. In some cases, a campus plan preserves the original design of a campus and the historic buildings and landscapes create institutional identity. For example, Harvard Yard was originally a cow pasture or 'cow yard' but it became part of the identity of Harvard. In other cases, a new innovation park, such as the one under construction at the University of Utah, helps a university push forward its academic agenda. In all cases, a strong campus plan adds value to an institution and leads to the success of both academic and institutional plans.

Different campus typologies challenge campus planning and this thesis explores the challenge of the urban boundary. In rural areas, campuses sprawl with seemingly endless space to keep growing. In cities, campuses are confined to their physical boundaries. Even though a university might own more property than an identifiable or visible boundary, the

campus is contained within that boundary by the growing city around it. Thus, the urban *university campus boundary* examines how a campus plan can continue to support the institutional and academic goals of a university when the university runs out of space and where the university meets the city around it.

Section 2: Premise of Research

When the colonists arrived in America, they brought with them a desire to establish intuitions of learning similar to the schools they attended in England. Initially, they built modest schools with the purpose of preserving the Puritan ideals and of educating the Native American populations. By building the schools away from the towns, in nature, the colonists aspired to reach the Native Americans and simultaneously protect the students from the harsh realities of the growing cities. The growth of cities eventually caught up with the growing schools and schools, out of necessity to protect their students, began to develop the condition of boundary.

Many early campuses developed a variety of boundary conditions as the cities around them grew. The expression of boundary took on many roles, from designating the perimeter of a campus to protecting the students of the college from the community around them. Boundary, in relationship to the university campus, took on a specific identity.

Campus boundaries exist. Whether tangible or elusive, there is a moment when an individual physically moves from city to campus or from campus to city. Campus architects challenge themselves to understand the meaning of boundary and to create various boundary conditions that express their institutions' intended relationships with the communities around them.

Section 3: Purpose of Research

The boundary of a campus possesses infinite possibilities for architectural expression of campus and community. *The purpose of this paper is to define (campus) boundary, explore types of existing campus boundaries, and create a typology of design strategies*. An architect can employ boundary a single design strategy at multiple parts of the campus or use multiple strategies in one specific part of a campus. The typology will provide ways of developing design strategy variations appropriate to a specific part of a specific campus.

Section 4: Process

The thesis will function in the following parts: defining boundary; exploring a connection between spatial organization and university campus; establishing a case study as a template for design; and unpacking a design strategy for the case study. Chapter Two of the paper will attempt to create a working definition of boundary: general to architecture, specific to the university campus. Additionally, this part of the paper will examine how architects look at city design and how the ideas can overlay onto the university campus, specific to the boundary of a campus. Chapter Three of this thesis will apply the typologies in the second chapter to a specific site – Gallaudet University in Washington, D.C. After briefly exploring the unique history and campus design of Gallaudet, the thesis will look at a specific corner of the Gallaudet Campus. Chapter Four will provide a design for the site selected on Gallaudet using the proscribed typologies. Finally, Chapter Five will conclude the thesis by proposing how the process might be furthered for other campus planners.

Chapter 2: Defining Boundary

Section 1: What is 'boundary'?

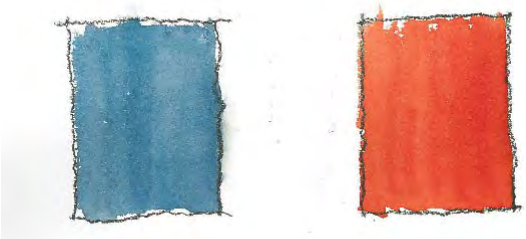

Figure 1. Blurred Boundary 1

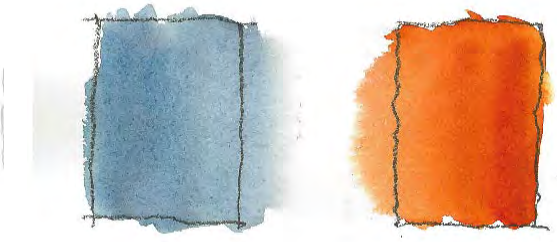

Figure 2. Blurred Boundary 2

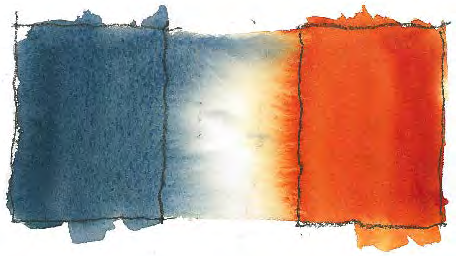

Figure 3. Blurred Boundary 3

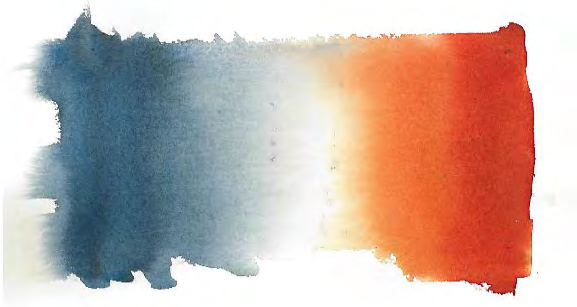

Figure 4. Blurred Boundary 4

Boundary is an indefinable moment, making it tricky to problematize the concept. It can be used to demarcate one space from another, such as the inside of a building from the outside world. It can remain invisible to the eye such as a boundary between countries. It can also exist in the abstract, such as the boundary between being single and being married or between life and death. It is that moment where a person ritually crosses from one to another such as becoming an adult. In the constructs of physical architecture, the boundary delineates the difference between two physical spaces. Within that boundary exists a form of opening, where the space on one side co-mingles with the space on the other. The boundary can be as slim a single pane of sliding glass or as deep as thick stonewall. When a person crosses the boundary, she moves through that interdependent moment, which is both one and the other, both inside and outside, or both here and there. To complicate the situation, a boundary can be as visible as the threshold of a doorframe or as complex as walking through a series of

thresholds such as walking from entrance of a prison to the confines of a jail cell. Many theories exist on defining boundary and each can support problamtization of, ‘What is boundary?’

Section 2: The Culture of Boundary

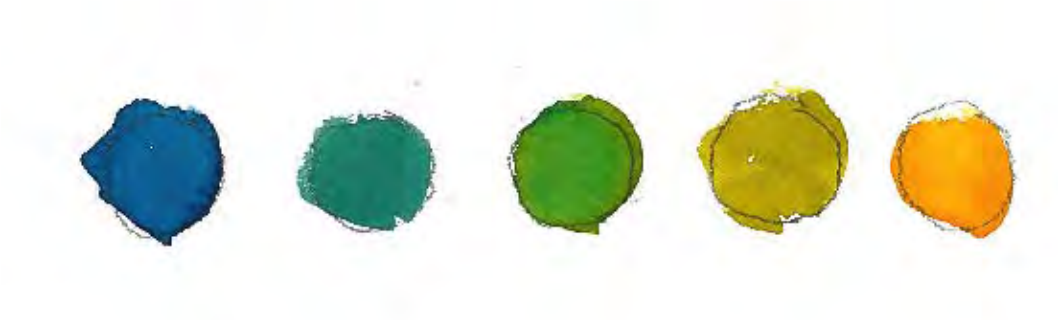

Figure 5. Ambiguity of Cultural Boundaries 1

Figure 6. Ambiguity of Cultural Boundaries 2

As humans define spaces through built form, they must establish boundaries to create the desired effect of the space. Ameri and Bacon contribute significantly to understanding the nature of boundary itself but it is the *why* that humans need to understand the concept boundary, that completes the definition. In Culture and Communication, Edmund Leach

writes, “a boundary has no dimension” (Leach, 1976, p. 33). Leach explains that, even though a boundary is established, there is still an ambiguity of the actual boundary. It is the act of crossing the boundary, to make a transition from one space to another, that establishes the boundary’s existence (Figure 7). That movement through the boundary at the transition is marked by a ritual. Such as the ritual could be saying, “I do,” during a wedding or passing through the graduation gate upon the confirmation of a degree. In a way, it is when the physical boundary changes into the social and spiritual boundary. With the layering of the experience, where does the ritual actually take place? Leach writes, “boundary separates two zones of social space-time which are normal, time-bound, clear-cut, secular, but the spatial and temporal markers which actual serve as boundaries are themselves abnormal, timeless, ambiguous, and at the edge, sacred” (Leach, 1976, p. 35). Beyond architecture, crossing boundaries is a ritual transition, from putting on a costume to transform into someone else, saying, “I do,” at the chapel alter to become a spouse as opposed to a bachelorette, entering the silence of a monastery or a library. More deeply, the ritual transition becomes ritual translation from what a person believes in the mind to be true to something entirely different, also within the mind (Leach, 1976, p. 70). It could be argued that this makes absolutely no sense. However, Leach argues that an individual’s ambiguity of boundary is created by cultural norms imprinted on a person from childhood.

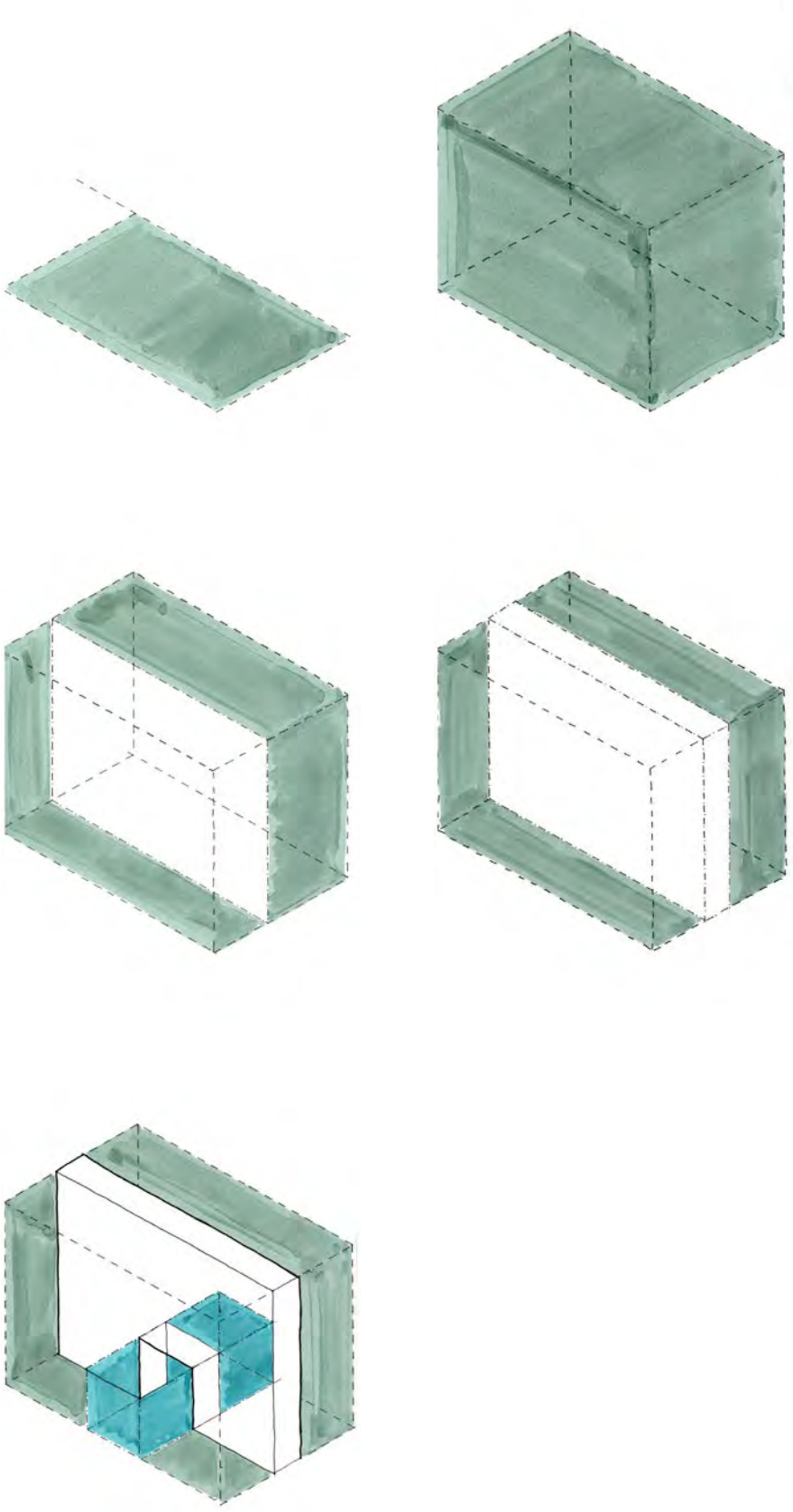

Figure 7. Three-dimentional diagram of boundary based on Leach and Klee

Using the lens of Leach, a boundary can be understood as a ritual transition from one to another. The ritual crossing from city to campus takes on a variety of ritual transitions. For example, it is the transition from the dirty, unclean nature of city to the pristine "ivory tower" of campus. It can be moving from a noisy environment to a quiet one, from an uneducated population to an educated one, from the real world to the idealized world. The boundary creates significance of one entity in relation to the other. The student cannot wait to leave the idealized world of the campus and entire what she perceives as the real world. She removes herself from the noisy, plebian city life to silently enter the campus with respect for those who share knowledge. The separation created by boundary helps a student distinguish one place from another. Thus, while a physical boundary does not need to be part of a ritual boundary, a ritual boundary, in some small way, is always part of a physical boundary. Even in the case of the student – she does not realize she has completed a ritual by crossing into the campus and yet from the moment she steps into the sphere of the campus grounds, she is identified by an observer as more than another person but as a student.

Section 3: Boundary in Literature

Ameri Boundary provides a "delineation, separation, and processional transition," according to Amir Ameri in On the Logic of Encampment (Ameri, 2016, p. 128). Ameri speaks specifically to transitions into libraries. While he outlines the different types of transitions into libraries as the library itself evolves, the application of transition can be applied to most situations. Ameri calls upon the term 'pharmakon,' a theoretical idea that suggests there is indeterminacy between spaces yet the boundary must exist to for a transition to exist. The boundary exists as a "link between space, form, and ideology," or the physical manifestation of one space and another (Ameri, 2016, p. 119). Ameri concludes by reflecting on Turner's response to Jefferson's University of Virginia, commenting that the campus, in

its quest for boundaries, “tries to keep [the world] without, only to have an ideal to reflect back on from within” (Ameri, 2016, p. 151).

In *Design of Cities*, Edmond Bacon looks both inward and outward from the boundary of a building and defines architecture as, “the articulation of space so as to produce in the participator a definite space experience in relation to previous anticipated space experiences.” (Bacon, 1976, p. 21). He argues that the nature of architecture evolves through generations and cultures yet the bases of this space defining and subsequent transitions remains the same. Bacon’s definition can also operate in reverse. In either direction, space must be defined and there must be a transition from ‘A’ to ‘B’ WHY?. To make such shifts, Bacon proposes that, “architectural forms textures, materials, modulation of light and shade, color all combine to inject a quality or spirit that articulates space,” or that the different sensations experienced between ‘A’ and ‘B’ come from the architecture. However, Bacon misses the key idea – while he argues that it takes more than just walls or boundaries to create architecture that, “infuses the space with a spirit which relates to the activities that take place in, it stirs the senses and emotions of the people who use it,” it those very boundaries that create the anticipation that allows senses and emotions to be experienced (Bacon, 18). Bacon fails to answer the question, “What is boundary?”

Architectural boundaries use the ritual transition to experience change, spatializing the ritual from something “abnormal, timeless and ambiguous” into something “normal, time-bound, clear-cut” (Leach, 1976, p. 35). Boundaries exist in many forms with various purposes and functions. Bacon simplifies boundary as a way of perceiving space. He uses four categories to express the following transitions (Figure 8 and 9). First, space exists as a “boundless unit, the continuous interaction of opposites” melded together to create unity (Bacon, 1976, p. 41). Second, when man enters the space, he “draws a line, whether physical or conceptual, dividing the system into two elements: love-hate, good-evil, indissolubly establishing duality” (Bacon, 1976, p. 41). Bacon’s idea of duality ties back to Leach’s way

of constructing a symbolic system of relationships. As the man continues to define the space, he creates "the dominance of one element and the sub-dominance of another," establishing a hierarchy between the spaces (Bacon, 1976, p. 41). The dominance and sub-dominance begins to represent the relationship of once space to the other: the religious sanctity within a church, the confinement of a prison cell, or the purity of the ivory tower. Finally, Bacon suggests that as the man encloses his space, separating one from another, and the man sees either the new space as an object or as "a plan of indefinite extent with a whole in it" (Bacon, 1976, p. 41).

The endotopic and exotopic, or object within space and space with void, an idea developed in 1964 by Swiss-German painter Paul Klee in, *The Thinking Eye*. Endotopic and exotopic define the third dimension, or more specifically, the how humans experience space. Klee uses the terms to explain that the duality of spaces such as "major-minor, large or small components, brilliance-darkness, behind-in front" creates the in-between spaces because "the main action takes place in the middle, through its relationship to the frontal planes 'behind and in front'" (Klee, 1964, p. 49). Klee defines endotopic and exotopic as "two principles of the positive-negative treatment of relief, applied to linear figures containing intersections…where the exotopically on the picture-plane tends to stand out [and] what is treated endotopically tends to recede" (Klee, 1964, p. 51, 54) (Figure 7). Bacon adds clarity to Klee through the last of his four categories of perceiving space. Bacon describes endotopic as based on shape, mass, and object where the in-between defines that which is within while he describes the exotopic as space, movement, and form where the in-between defines that which is without. Using Klee and Bacon, the boundary creates spatial separation and becomes ambiguous. However, Klee's suggestion of the fourth dimension of time expresses the symbolic moment that Leach describes. An established boundary weaves together the fourth dimension of time, with the ambiguous in-between space, and the symbolic differentiation that humans move between (Figure 8 and 9).

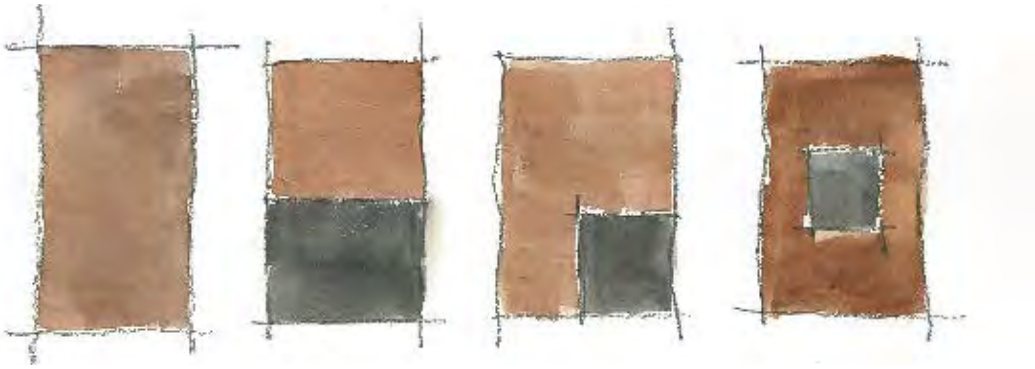

Figure 8. Interpretation of Bacon's interpretation of Klee's Endotopic/Exotpic 1

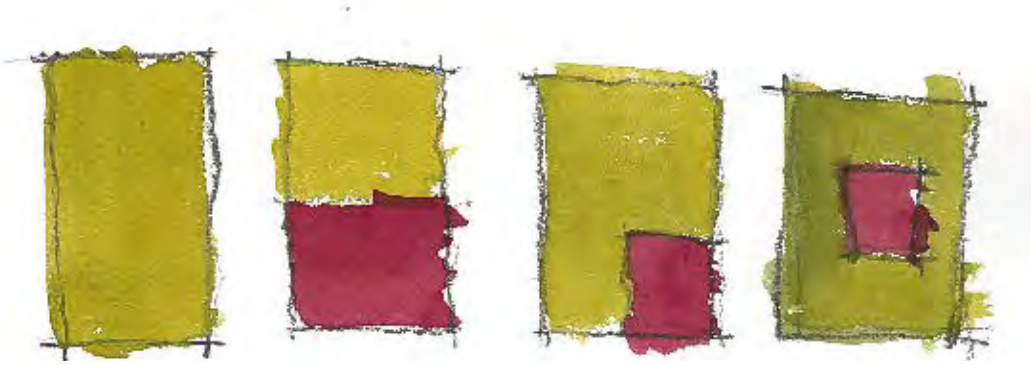

Figure 9. Interpretation of Bacon's interpretation of Klee's Endotopic/Exotpic 2

Section 4: Why do urban campuses need boundaries?

Urban campus' attempts to create the traditional culture of Ameri's boundary yet urban places are messy. Bacon argues that in most cities, "buildings of character which lose their effectiveness because they are situated in out-of-the-way locations" or conversely there are buildings that reside in prominent places but are "uninteresting… which make no contribution to the surrounding area" (Bacon, 1976, p. 18). Urban campuses use boundaries to delineate from "uninteresting" area around them by creating "out of the way" places that offer something different from the city. The boundary between campus and city is employed to create a place that has distinct identity, therefore reversing the confusion described by Bacon. Further, the urban campuses buildings at campus edges should architecturally stimulate and integrate campus with city "so that the influence of the fine buildings radiates

outward, articulating the whole fabric of the city" – the building becomes the campus edge (Bacon, 1976, p. 18). Bacon's idea here could be a reflection of Ameri's aforementioned premise on campus boundary.

Section 5: Using Lynch to Understand Campus Boundary

Campuses function as small cities, controlled by their own governing systems and bound by their own cultural identity hold them unique and different to the area around them. Just as Lynch argues that, "the art of shaping cities for sensuous enjoyment is an art quiet separate from architecture or music or literature," so to is the art of designing campuses (see art of campus design) (Lynch, 1960, p. 2). Lynch describes the lack of awareness Americans have regarding a city's potential, "value of harmonious surroundings, a world which they may have briefly glimpsed only as tourists or as escaped vacationers," because their experience of their own cities is of, "the dirt, the smoke, the heat, and the congestion, the chaos, and yet the monotony of it," (Lynch, 1960, p. 2). Lynch's preliminary analysis of the American city provides an opportunity to use the American university campus as the sandbox for his ideas of good city design. With the number of people interacting with universities today, a walk through university campus could be equated with a vacation from the existing urban environment. The campus can be the antithesis of the city experience: clean, clear, cool, and open yet offering excitement, energy, and engagement. Suggesting that a campus offers community might go too far but a campus can provide what Lynch suggests a city might offer. Thus, incorporating the organizing elements of city design that Lynch puts forward within a campus design can strengthen the overall function of a campus.

The Image of a City can help define the boundary of the campus. The principles of Lynch can be used throughout a campus design but how Lynch can be used at the boundary that will strengthen the campus as a whole and enrich how the people engage the campus

from the moment they step through the boundary. Lynch's Path, Edge, District, Node, and Landmark can help architects understand the interrelationships between campus elements and the campus boundary (Figures 10-14). Lynch describes these elements as "easily identifiable" by an individual and that "are easily grouped into an over-all pattern," (Lynch, 1960, p. 3). Similarly, the elements of a campus are similarly defined, including the Quad, the library, the main administration building, the chapel, and the plethora of banners, flags, busts, benches, signs, and archways that symbolize the campus. However, these elements comprise the iconology of the campus instead of actual elements that facilitate strong design. Lynch's elements provide a basic structure to understanding campus design.

Alternatively, Christopher Alexander's Pattern Language provides a complex system of design. Developed at the University of Oregon in the 1970s, the Pattern Language sets forth a language for design that all people can relate to. Alexander describes the patterns as, "a problem, which occurs over and over again in [the] environment, and then describes the core of the solution to that problem, in such a way that [a designer] can use this solution a million times over, without ever doing it the same way twice" (Alexander, 1970, p. x). Alexander lists 253 identified patterns that people encounter and provides solutions to the problems in these patterns. Unfortunately, in an effort to create a universally simplistic design pattern, Alexander created something too specific and to detailed given the constant evolution of society and its physical world. The Pattern Language lists problems that should be considered in design but it does not suggest all of the possible solutions or acknowledge how the Pattern changes. While it acknowledges that adaptations can be made to solutions, the text seems to proscribe to be wavered from in any way. The take-away from Alexander to this thesis, and thus woven back into Lynch, is the following statement: "…when you build a thing you cannot merely build that thing in isolation, but must also repair the world around it, and within it, so that the larger world at the one place becomes more coherent, and more

whole; and the thing which you make takes its place in the web of nature, as you make it" (Alexander, xiii).

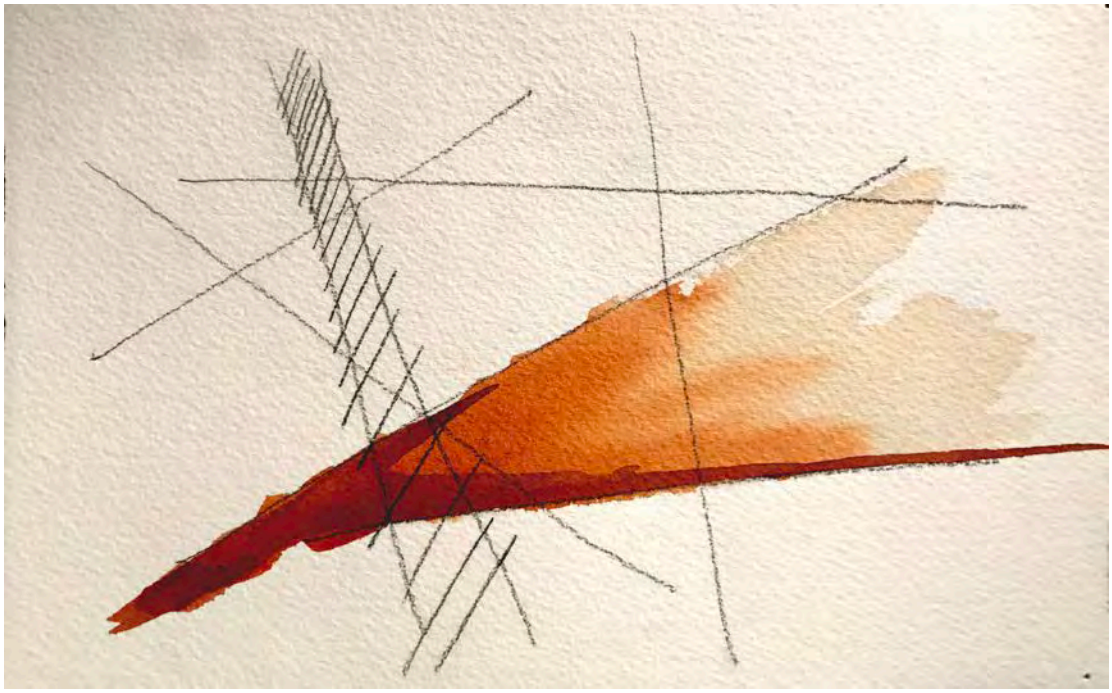

Figure 10. Path

Lynch describes *Path* as "channels along which the observer customarily, occasionally, or potential moves" (Lynch, 1960, p. 47). Paths allow movement not only from one point to another, but also to every point along the way. Users identify paths with specific actions such as a street for shopping or a sideway to the neighborhood park. Paths also take on distinctive natures based on size and proximity, such as the difference between Broad Street in downtown Philadelphia and that little streets in Rome that lead to the Pantheon. The rhythm of a path can change depending on the direction of the user and the paths can vary based on divergence and convergence. An example of this is the "trident" in Rome; the Via del Corso, Via di Ripetta, and Via del Babuino converge at the Piazza del Popolo but their paths seem to change depending on the direction a person walks them. Thus, the integration of a variety of paths within a city creates diversity and variety for the user.

Campus *Paths* take on the same meaning: channels for a variety of campus users to navigate around and through the campus. From broad entry paths into the heart of the campus such as Palm Drive on Stanford's campus to the winding, romantic paths of Cranbrook, each campus path holds different meaning and importance to the overall layout of the campus. On occasion, the campus design places dominance on one path but the users choose another path as for their main use. The challenge with developing paths on campuses is anticipating the desired movement. Additionally, paths can be constructed through and around buildings and their importance holds as much weight to the campus. For example, the path through the Illinois Institute of Technology's McCormick Tribune Campus Center draws students through the building, continuing the paths across campus through the building. Thus, path typology can change on a campus.

Figure 11. Edge

Edges distinguish one place from another. Lynch argues that edges are, "the linear elements not used or considered as paths by the observer. They are the boundaries between two phases, linear breaks in continuity: shores, railroad cuts, edges of development, walls"

(Lynch, 1960, p. 47). In consideration of Lynch's position, his definition of edge stands correctly, as a "lateral reference" between to places (Lynch, 1960, p. 62). However, his ideas can be questioned when he introduces the concept of boundary, given the working definition established previously. Is the establishment of edge take away from the fluidity of boundary? Lynch also proposes that edges are, "uniting seams, rather than isolating barriers, and it is interesting to see the differences in effect" (Lynch, 1960, p. 65.) This has the potential of bringing edge closer to boundary through the use of the term seam. Seam suggests an intermingling of spaces and ideas. Thus, boundary can take the nature of holding off and at the same time of bringing together. This idea connects back to Eco's idea of Protean, something that grasps at both the tradition separation and the utopian mingling. Lynch also briefly examines edge as vertical as well as horizontal. He gives an example of the elevated railroads in Jersey City and Boston (Lynch, 1960, p. 65). The study models of boundary reflect the opportunity to unfold boundary in both the vertical and horizontal condition and deeper, Klee's theory of endotopic and exotopic within a space. Lynch's edge, when looked at through Klee, directly applies to establishing boundary.

On a university campus, edge takes on similar meaning depending on how the campus is studied. Many campus, urban, suburban, or rural, express edge as entities that separate parts of a campus from itself or the surrounding areas. For example, the Mississippi River separates the University of Minnesota into two distinct areas of campus, almost creating two different campuses. Or, consider Yale University's Row, which uses the buildings as a distinct edge to hold the square. However, when edges develop into deeper ideas, such as boundary, they become interesting. If edge is a type of boundary, then it can work in fluidity to how a campus and a city comingle with each other.

Figure 12. District

Districts denote areas within a city easily identifiable and distinguished from the rest of the city. The characteristics of the district can vary to include, “texture, space, form, detail, symbol, building type, use, activity, inhabitants, degree of maintenance, [and] topography” (Lynch, 1960, p. 67). Districts flex at their boundaries, spilling out into the city in different ways. For example, in the International District in Seattle, large Chinese dragons spiral up the lampposts at the corners of the designated district. However, the International District extends much farther that those boundaries through an assortment of grocery stores and restaurants. Lynch explains that districts have “hard, definite, and precise” boundaries while others might be “soft or uncertain” and a few “have no boundaries at all” (Lynch, 1960, p. 69).

To this end, a university campus within a city is a district. Universities house a unique collection of individuals and takes on a specific form and building typology that separates itself from the city. However, university districts take on different natures. For example, the University of Washington in Seattle sits within the University District. The

campus stands unique to itself, however, the culture of the university community spills out west and north of the campus. Students populate the neighborhood, dining and living off campus. In some sense, this could be considered an ambiguity in the campus boundary. However, when strictly examining the campus, it is the defined boundaries of the campus that stand true. Thus, which is the district?

Figure 13. Node

Lynch describes *Node* "strategic foci" within the city that either serve as "junctions, places of break in transportation, a crossing or convergence of paths" and/or "concentrations, which gain their importance from being the condensation of some use or physical character" (Lynch, 1960, p. 72, 47). Lynch does not spend much time or paper discussing the nature of nodes. However, nodes might be some of the most intriguing parts of a city. The plethora of piazzas in Rome provides the best example. Each takes on its own character and style. Some bustle with activity, hosting markets and cafes spilling out into mingling crowds. Yet others possess a quiet, tranquil quality that provides a place of pause in a busy city.

On a university campus, nodes come in all shapes and sizes. An active node might be the main quad or the lobby of a student union while a passive node might be the first floor of a library or a gateway into a quieter part of campus. Developing strong nodes on a campus help build community because they allow people to come together or pass by one another and recognize each other in the grander context of a campus. In some cases, they might even become landmarks on the campus.

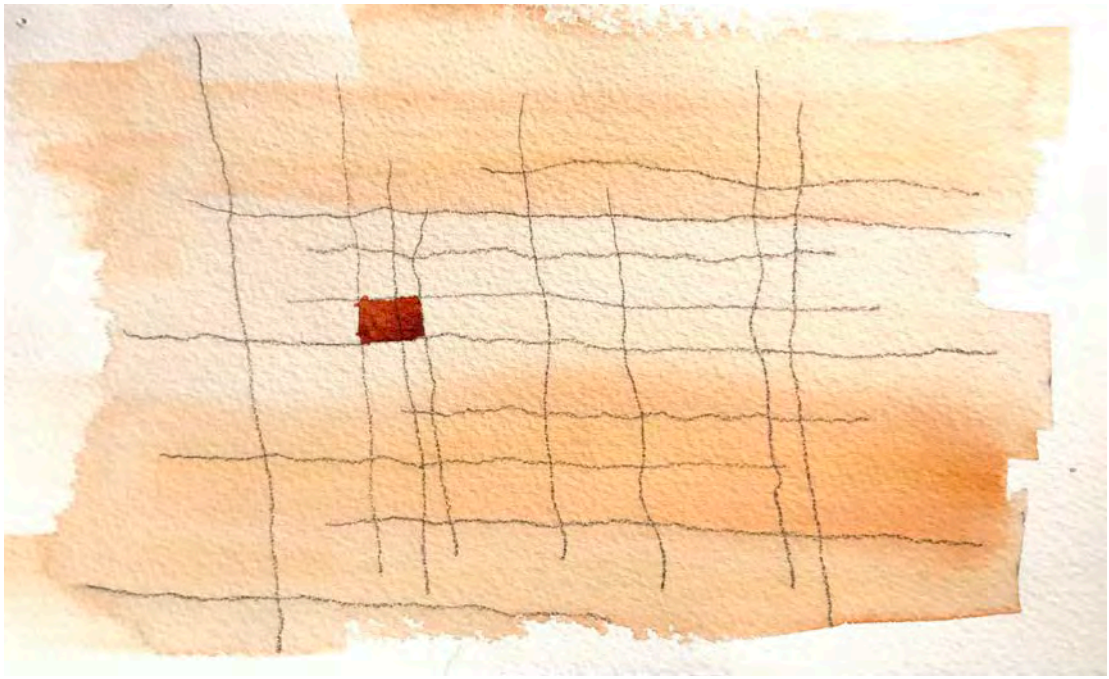

Figure 14: Landmark

Landmarks stand as guiding points throughout a city that serve as both identifiers of the city and as way-finding for people. Lynch describes landmarks as, "point references considered to be external to the observer" (Lynch, 1960, p. 78). Large landmarks include the Space Needle in Seattle or the Washington Monument in D.C.; the large scale provides reference points throughout the city and serve as "directional orientation, or more frequently, symbolic" to the city (Lynch, 1960, p. 82). Smaller landmarks take on a closer relationship to people, such as a famous local coffee shop or library. Lynch notes that smaller landmarks

might be featured in a “sequential series of landmarks, in which one detail calls up anticipation of the next and key details trigger specific moves of the observer, appeared to be a standard way in which these people travel through the city” (Lynch, 1960, p. 83).

Campus landmarks can develop and strengthen the culture of a campus. The Cathedral of Learning at the University of Pittsburg or The Tower (Main Building) at the University of Texas, Austin identifies each campus as a symbolic representation of the identity of the campus. In turn, Locust Walk, a path running through the University of Pennsylvania’s campus ushers a person through the campus with each new landmark along the way. Here, the landmark circles back to become a path as it takes on a sequential rhythm where a person experiences a different path depending on the direction she walks. The creation of new campus landmarks through campus planning and design can be difficult. Due to the historic nature of many campuses, landmarks tend to be established in the culture of the campus and new landmarks can be received with skepticism and potentially ridicule. Thus, a campus planner might work with the existing landmarks to develop a plan that honors and recognizes them no matter the “siting, age, and scale” of the landmark (Lynch, 1960, p. 80).

Lynch’s Elements in The Image of the City outlines basic criteria for good city design and good campus design. A campus planner should adapt each element to new campus designs to create a more fruitful and rich campus. In addition, in the context of an urban campus, the use of Lynch’s Elements supports the development of the campus within the larger city context. The Elements can also scale down to the design and layout of a build and its surroundings to create an organization pattern familiar to a person as she moves from the larger scale of the city on to a campus and into a building. Additionally, strong traces of Lynch’s Elements fit into the DeafSpace Design Guidelines outlined later in this paper and support the use of the Elements within the proposed case study for this thesis.

Chapter 3: Gallaudet University

Section 1: Campus Selection: Gallaudet University

Gallaudet University, located in Washington, District of Columbia, offers a unique site on the edge of its campus for the purpose of this thesis study. Through its campus planning efforts, Gallaudet University identified a site at 6th Avenue NE and Florida Avenue NE an opportunity to create a new type of space on Gallaudet's campus. Though the 2022 Gallaudet Campus Plan, Phase 2 indicates a type of "gateway" to the campus, the current design competition pushes for something more – a place for the city and the campus to meet. Gallaudet University offered a local site and the community graciously allowed access to the campus and the groups participating in the design competition. In addition, the site included proposed space for an innovation lab. Thus, the site actualized three target areas identified in the introduction: institutional planning based on the desire for a gateway to campus; academic planning as identified by the innovation lab; and campus planning through the open site identified for development in the Campus Plan (Figure 15).

Figure 15. Gallaudet University 2022 Campus Plan Gallaudet University. http://www.gallaudet.edu/campus-design/2022-campus-plan/projects.html

Though Gallaudet's site seamlessly fit into the theory of the thesis, working with the specific campus culture proved challenging and at times, this thesis struggled to maintain its scope. As discussed through Klee and Eco, establishing an individual's sense of boundary comes from an individual's cultural constrains. For each person, the layers of culture come from various cultural overlays in a person's life and during college, a dominant culture is the university itself. This is why, as Alexander's Pattern Language was criticized, that a set of specific design principles for designing at the University edge cannot be create. Each university is different and Gallaudet University, the national institution for the deaf, might be considered an outlier in university typology and culture. As such, there are many aspects of Gallaudet's culture and history that must be placed to the side in an effort to keep the focus of this thesis to the topic of boundary.

Section 2: A Brief History of Gallaudet University

The ability to communicate with one another breaks the boundary between individuals. At a basic level, the cultural boundary between Gallaudet and the city is an inability to communicate between two cultures – the deaf and hard of hearing community and the hearing community. Gallaudet University was officially founded as the College for the Deaf and Dumb on June 28, 1864 following a law passed by Congressed and signed by President Lincoln on April 8, 1864 (Armstrong, 2014, p. 4). Edward Miner Gallaudet, the College's first president, took built upon the already established Columbian Institution for the Instruction of the Deaf and Dumb and the Blind by Amos Kendall. The school stood on Kendall's property in northeast Washington, D.C., just north of Florida Avenue, N.E. Oddly appropriate for this thesis, boundary road was originally one of the boundaries of the city and it was originally called Boundary Road. As the College grew, Gallaudet hired Fredrick Law Olmsted to design a plan for the campus.

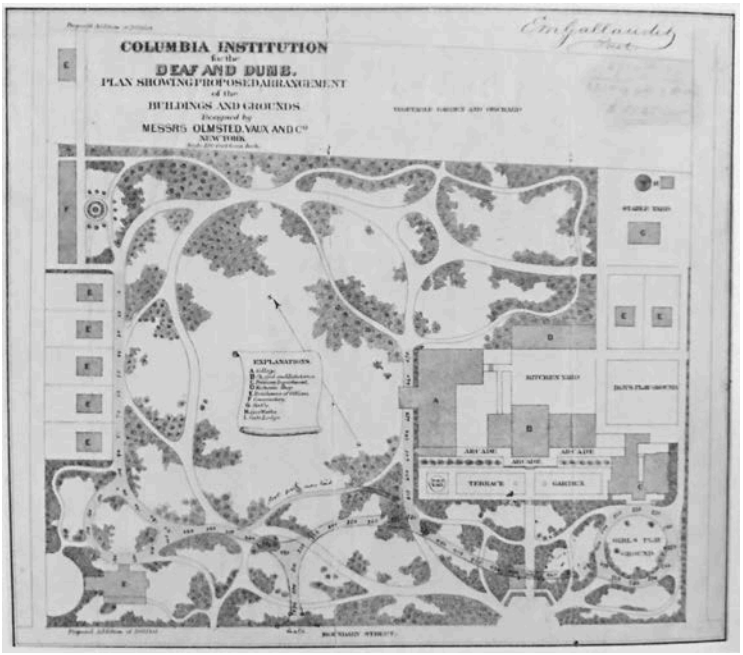

Figure 16. Campus Plan proposed by Frederick Law Olmsted in 1866 (Armstrong, 26).

Section 3: The Olmsted Green

In 1866, Olmsted proposed a campus plan to Gallaudet that included academic space, a row of faculty houses, and a large green. Olmsted wanted ambling green laws for the students to enjoy while living at the College. Only three of the five proposed faculty row houses were built and the shape of the Olmsted Green, named in honor of Olmsted's contribution to the College, morphed and changed over time. Olmsted's proposal became crucial to the design process because it provided clarity in how to think about existing buildings and how to design around them.

Section 4: Review of the DeafSpace Design Guideline

Over the last decade, the Gallaudet community developed the DeafSpace Design Guide. DeafSpace identifies five major categories important to designing for the Deaf community: Space and Proximity, Sensory Reach, Mobility and Proximity, Light and Color, and Acoustics and EMI. The purpose of this thesis is not to focus strictly on DeafSpace, however, the thesis design for Gallaudet will attempt to integrate DeafSpace to a certain extent into the design without compromising the intent of the thesis. The following section reflects the material in DeafSpace Design Guidelines, Volume 1, a working draft written by Hansel Bauman in 2010.

Space and Proximity focuses on the relationship of a person to other individuals and the space around them. Signing requires space to communicate, space to see another individual sign, and space to allow for a group of people to engage in a conversation. Thus, space dictates the level of privacy in a conversation. Spatial requirements include space for an individual to sign, space for to see others faces, closeness for a quick touch if needed, and space to step back to see a larger conversation. Conversations form around group configurations to include all in the conversation and take on further dimensions based on the type of gathering space: group seating, presentation spaces, classrooms, meeting rooms,

lecture halls, and auditoriums. In addition, public spaces require spaces of partial or full enclosure to create distinctions between public and private conversations – consider the fact that whispering is not an option for a deaf person when someone across the room can watch an entire conversation and understand every word. On a small scale, some space ideas mimic Lynch that include nodes and paths, and districts while design guides use vertical space and linked spaces between interior and exterior spaces. Collectively, the Space and Proximity category fits directly into the visual and physical understanding of boundary.

Sensory Reach considers the dimensional sensory experience of an individual that provides cues that go beyond what a hearing person might take for granted. Bauman describes these as "mechanisms that allow [Deaf people] to extend their Sensory Reach such that they can successfully sense the world around them" through seeing, smelling, and feeling (Bauman, 2010, p. 42). Elements of consideration for this category include peripheral vision, transparent materials, reflective surfaces, vibration, and shared sensory reach which all contribute to how a person experiences the world in 360 (Bauman, 2010, p. 42-43). Again, Lynch's ideas come into play, from reaching paths with easily accessible views to developing landmarks that allow individuals to "orient themselves within a greater campus" (Bauman, 2010, p. 44-45). Various levels of transparency/opacity, the size of openings, and the use of lighting strategies contribute to the use of light and the privacy of spaces. The dominant features in this category are reflection and vibration. Reflective surfaces show movement and conversation taking place spaces where direct lines of site are not available. For example, a series of reflective surfaces within a residence hall suite can allow for communication between kitchen and living room or mirrors around turns allows an individual to see someone approaching him instead of simply hearing the other person. Vibration provides a similar experience for a deaf person but should be considered in both directions. Vibration can allow a deaf person to use tactile senses to feel someone approach or people passing by. However, vibration can be distracting, so dampening vibrations that can travel between rooms or the

vibrations of mechanical equipment such as air conditioning units is equally important to design. Ultimately, this category features elements that a designer would not normally consider but contribute to the comfort of deaf individuals.

Mobility and Proximity focuses on pathways, flows, thresholds, and spatial sequence both in the horizontal and vertical direction. This category considers lines of site, pockets and eddies for conversation, dimensions of paths, hierarchy of paths, stair and ramp configurations, and the rhythm and repetition within design. Each of these topics can directly support the design of this thesis, from consideration of the paths onto campus to the use of arcades and patters on a building façade (Bauman, 2010, p. 72-73). In conjunction with the concept of boundary, this category's design elements should be considered beyond the idea of DeafSpace.

Light and Color play a pivotal role in how deaf individuals communicate with one another. Sign language requires eye-focus. Bauman explains that the need for "constant visual focus and rapid eye movement can cause eyestrain – resulting in attention loss and fatigue particular amid poor environmental conditions that obscure visual clarity" (Bauman, 2010, p. 74). By implementing a light and color strategy, a design can support communication and personal health. Color creates identifying markers such as eddies or pathways as well as it can highlight a conversation by dulling the background surfaces. Bauman recommends a balance of multiple light sources that can both aluminate spaces and conversations and define spaces. Light also fits back into Lynch's use of paths – light can improve way-finding and night eddies along a path. Light and color should be considered in all aspects of any a design but there is a layered meaning to their use in a space for the Deaf.

The final category, Acoustics and EMI, focuses on sound and ambient noises. This area supports members of the Deaf community who are hard of hearing and might use cochlear implants or hearing aids. Since a hard of hearing individual needs to use other senses to focus, a reduction in noises supports his needs. In addition, it makes the environment

friendly for hearing individuals within the Deaf community who are not familiar with using their other senses to communicate.

The beauty of DeafSpace stems from its universal applicability. All of the categories improve design for not only the Deaf community but also the Hearing community. Since the Gallaudet site bridges the boundary between the Hearing community and the Deaf community, DeafSpace supports a universal design for all users. Again, DeafSpace Design Guidelines do not guide this thesis. However, DeafSpace will strongly influence this specific thesis project. In prior sections, the thesis established that each campus requires unique community considerations overlaid on the condition of boundary. DeafSpace is unique to Gallaudet University and should receive the appropriate attention while recognizing an entire thesis could be written on the integration of DeafSpace into any and all design projects.

Section 5: Engagement Priorities

The following engagement priorities were established to guide design. Each acknowledges the mission of the institution, the DeafSpace Guidelines, and the established definition of boundary:

Priority One: Bring the community onto the campus by establishing it as a landmark in the neighborhood. To do so, the campus must be physically opened up to the community. Over time, Gallaudet has used its campus footprint as a physical boundary. To protect this population from the neighborhood around the campus both because of a communication barrier and because of the dangers of the neighborhood, Gallaudet built a wall around a majority of the campus that physically holds the campus in and the city out. A building or pair of buildings could act as a gateway into the campus where one does not currently exist; a physical building that embodies the established definition of boundary.

Priority Two: Connect Gallaudet with Union Market and the future development in the neighborhood. Union Market already stands as a landmark in Gallaudet's neighborhood. Between the large symbolic sign pronouncing its location to the well-established events that bring neighbors and DC residents to its spaces, Union Market provides a type of anchor in the neighborhood focused on retail. Gallaudet owns a majority of the land south of Union Market and it is exploring development options that would bring in mixed-use buildings. The University is also exploring development opportunities on its campus directly across the street from Union Market.

Priority Three: Teach the community how to sign. Gallaudet recognizes that a boundary that exists between its community and the surrounding neighborhood is the nature of the population of Gallaudet itself. Gallaudet wants to be more than a 'deaf school' but it wants to

celebrate deaf culture beyond its campus and it wants to create an inclusive community surrounding the campus where students can comfortably explore the city.

Priority Four: Develop a signing community, from new signers to alumni and others in the Deaf community moving close to Gallaudet – a Deaf community in the heart of the Nation's Capital. Building upon Priority Three, there is an opportunity to not only create a place where those in the deaf community feel comfortable living and working but also a place where all people can live together and building community without the barrier or language.

Priority Five: Encourage the student body to get out into the neighborhood and bring the campus out into the community. All priorities lead to this one – to weave together the neighborhood and the campus in a way that changes the nature of the relationship between Gallaudet University and its neighborhood.

Section 6: Site Specific Design

In addition to the engagement priorities, there are physical, site specific design needs that must be met in this building. A diagrammatic study was completed of the site and its surroundings to study: Pedestrian Movement Between Zones; Landscape – Stitching together various urban fabrics (green of campus to hardscape of city); Scale – Relationship of Building Typologies On/Off Campus; and Pulling Gallaudet into the Community. The resulting series of diagrams led to the siting of the buildings and an understanding of the importance of using the corner of Florida Ave., NE. and 6th Street, NE (Figures 17-19).

Section 7: Understanding Boundary as Architecture at Gallaudet University

The site diagrams provided an opportunity to explore three approaches to the corner. These approaches stripped the concept of boundary down, simplifying how Gallaudet could approach the corner. There are three possibilities: 1) Protecting the Campus from the City; 2)

Opening the Campus into the City; and 3) Merging/Mingling the Campus with the City. The final design uses all three possibilities because all three are part of a boundary. Diagrams looking at protecting the campus from the city propose buildings that create a physical barrier. Between their mass and positioning, they keep communities from interacting (Figure 17). Diagrams that opened up the campus looked back at Olmsted's proposal for the campus and pulled the Olmsted Green out into the city. These diagrams attempted to almost remove the boundary so that while it existed through use of landscaping, it created ambiguous space (Figure 18). The final mingling/merging diagrams began to create a pair of buildings with a plaza and/or open stair to bridge between campus and community (Figure 19). From here, the design progressed into a pair of buildings with a slopped plaza (Figure 20).

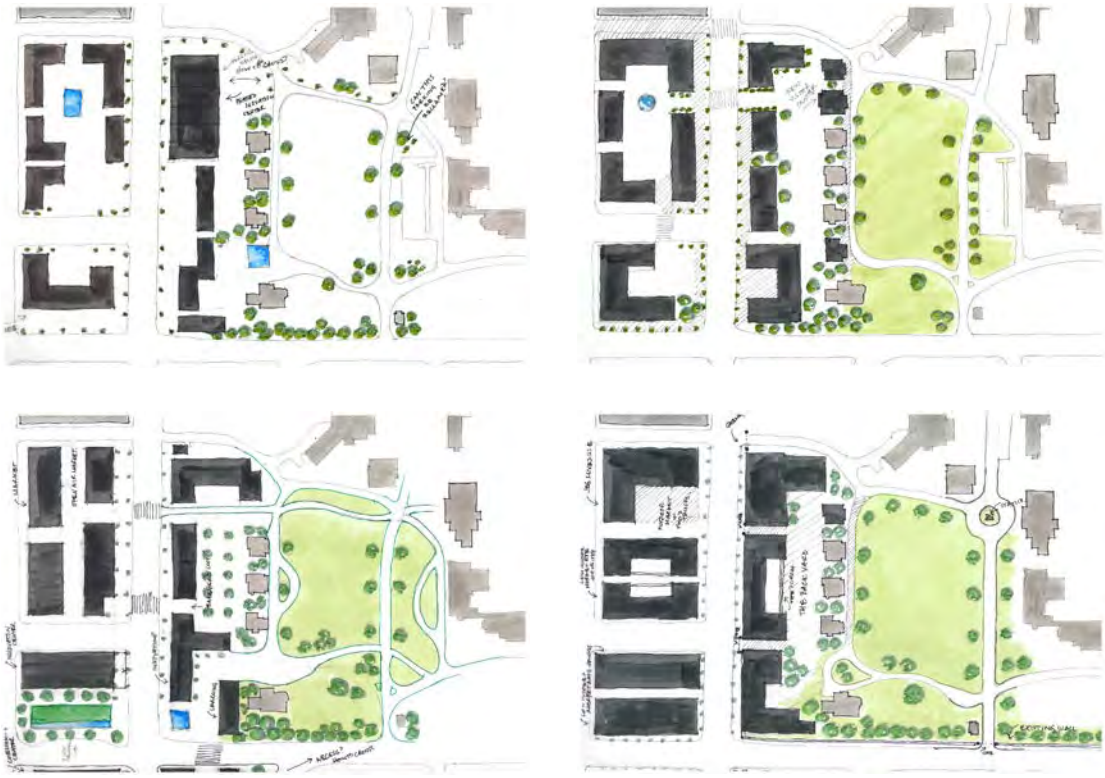

Figure 17. Site Analysis – Protecting the Campus

Figure 18. Site Analysis – Opening the Campus into the City

Figure 19. Site Analysis: Merging/Mingling the Campus with the City

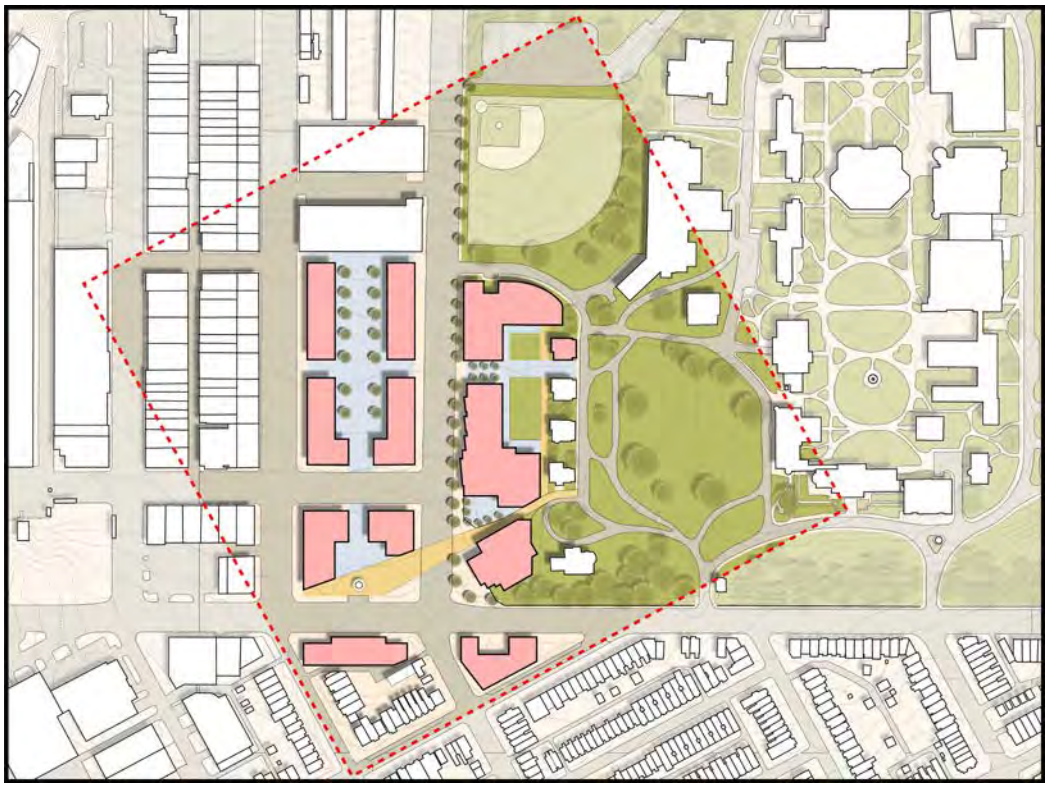

Figure 20. Proposed Site Plan

Chapter 4: Proposed Design

Figure 21. City to Campus – Proposed View from the corner of 6th Street, N.E.

Section 1: Conceptual Idea

Based on the needs of Gallaudet and the guidelines of both the existing campus plan and the design competition, the proposal for this site is a pair of buildings that open up the campus to the community through varying paths and a series of public spaces. One building seeks to bring the community into the campus through a community hall at the center of a community center. The other building brings the campus into the community through a large tiered lecture hall and an innovation center. The pair of buildings crank open to create a wedge-shaped space with the wide end facing the city and the narrow end opening onto the campus (Figure 13). This design purposefully slows the visitor down when entering the campus, not only through the channeling effect of the building but also through the upward slope of the topography (Figure 14). In reverse, when a member of the university walks to the city, she can acclimate herself to the changing environment as the space widens or she can choose to spend time on the terrace plaza to view the city before her before stepping into a

realm so different from that of Gallaudet (Figure 15). The buildings also work with the topography to create different types of paths for movement into and out of the campus. Thus, even though the mental condition of boundary is established, as discussion before, the point of change from campus to city and city to campus can vary between individual.

Figure 22. Campus to City – Proposed View from Olmsted Green between buildings

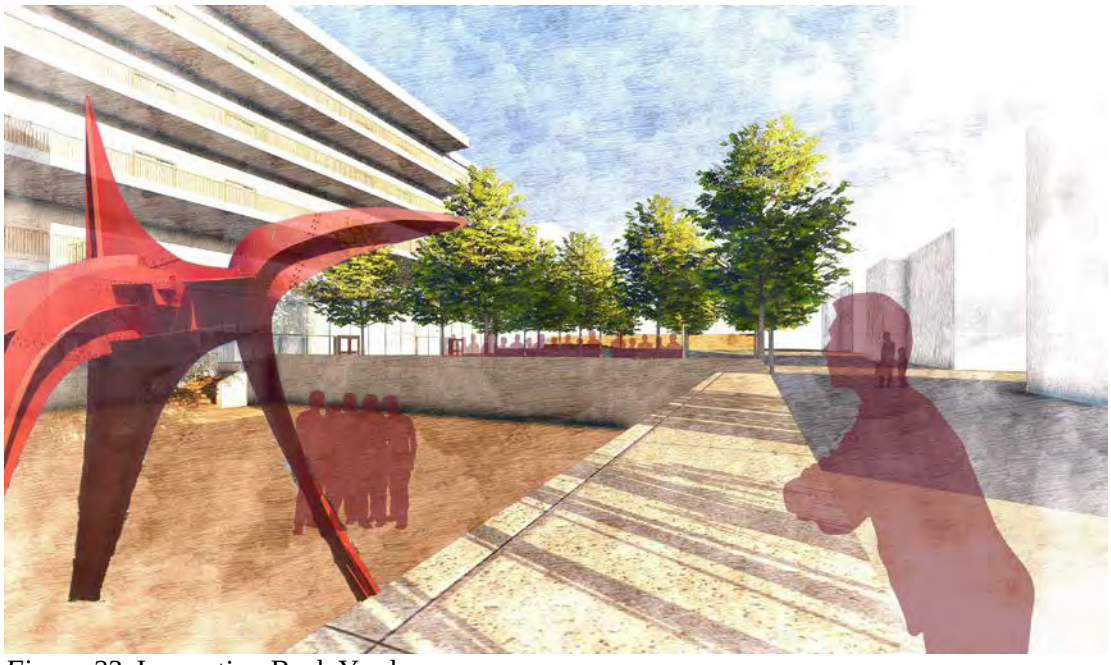

Figure 23. Innovation Back Yard

Section 2: Program

The program of the site is divided into three different parts: the community center, the innovation center and lecture hall, and the outdoor plaza spaces. Each provides the user with different experiences and spaces while continuing to confront the user with different interpretations as to where the boundary of the university and the city exist. All three support the campus plan and design while the buildings, specifically, look at how architecture itself can function as boundary. The challenge of the program was to create spaces that the community and the campus needed that could be accessed in both directions with equal importance.

The idea behind the Community Center stemmed from Gallaudet's desire to usher the community into the campus. Around Gallaudet, there are few places to gather and most of them are schools. The site provides an opportunity for the community to gather together at a central point and it helps Gallaudet become an anchor point in the community beyond just existing as a landmark in the community. The Community Center breaks from the city grid at a 30-degree angle so the two 'fronts' of the building can engage the neighborhood and the campus. The façade of the city-side of the building highlights the a large, double-height community room with glulam framing that seats over 350 people and provides views out to the city. Ground floor of the building hosts a large triple-height lobby and a university bookstore and coffee shop. This allows Gallaudet to establish an inviting street front that welcomes visitors walking up Florida Avenue, NE towards campus. The lobby includes a large, gestural stair that ushers visitors upstairs to the community room with a halfway point on the campus (Figure 24). Students entering the building from the campus will find themselves at this stair with the option to travel upstairs to the community room or downstairs to the café. Above the community room are two floors of break-out meeting or classroom

spaces along with a green roof. These spaces are intended for community use for both meetings as well as sign-language classes.

Across the plaza, a second building stands as an Innovation Center and serves as a different style of mixed-use building. Half of the building hosts a tiered lecture hall with open innovation space underneath. The other half of the building is the innovation center itself. The ground floor provides three shell-space innovation shops that could be transformed into innovation retail such as a teaching kitchen and pop-up restaurant or an artist's mixed-media studio. All of these spaces open up onto the "backyard" between the building and Faculty Row for additional outdoor space for creating (Figure 23). The upper three floors are more formal innovation spaces intended for incubation space for faculty use. From the plaza, a visitor can enter a triple-height lobby space and directly walk into the lecture hall at the stage level. The lobby leads to a building core providing access to the upper floors. The lecture hall is built into the slope leading up into campus with a second entry from a lobby at the campus level leading halfway into the lecture hall. From the campus entry, there is also direct access to the lower level innovation space below the lecture hall and upper level event space. The purpose of the event space at the top/back of the lecture hall is intended to be a gathering place before or after a lecture. There is additional space above this event space in the form of an open green roof, high enough to provide views out onto the campus. Where the Community Building provides a grand stair as a way of blurring boundary, the Innovation Center uses the building functionality as a way of moving people between campus and city.

The plaza itself is the third variation of boundary between the campus and the community. The periscope shape of the plaza funnels visitors into the campus while providing an easy and safe walk for students out into the city. The plaza uses the natural slope of the campus from the city to the campus; while a carriage stair is designed at the middle of the plaza, it is the slope itself that ushers people from between campus and community. The

transition from campus to city breaks up into an upper plaza that students (and neighbors) can sit in and inject themselves into the city while not directly engaging them. Thus, the plaza can be both static and dynamic.

Figure 24. Community Center – Lobby at Ground Floor

Figure 25. Community Center – Lobby from Third Floor

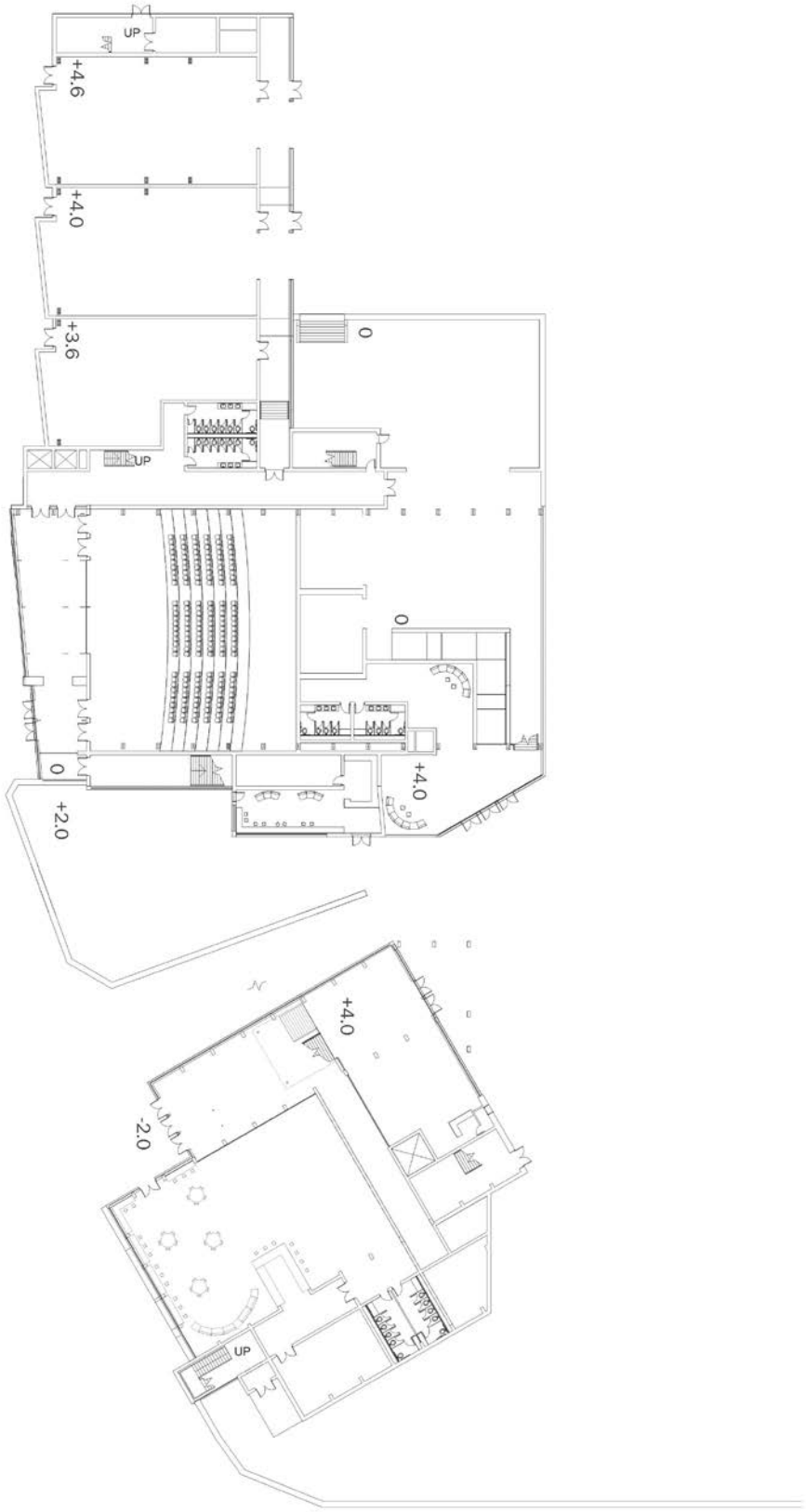

Figure 26. Ground Floor

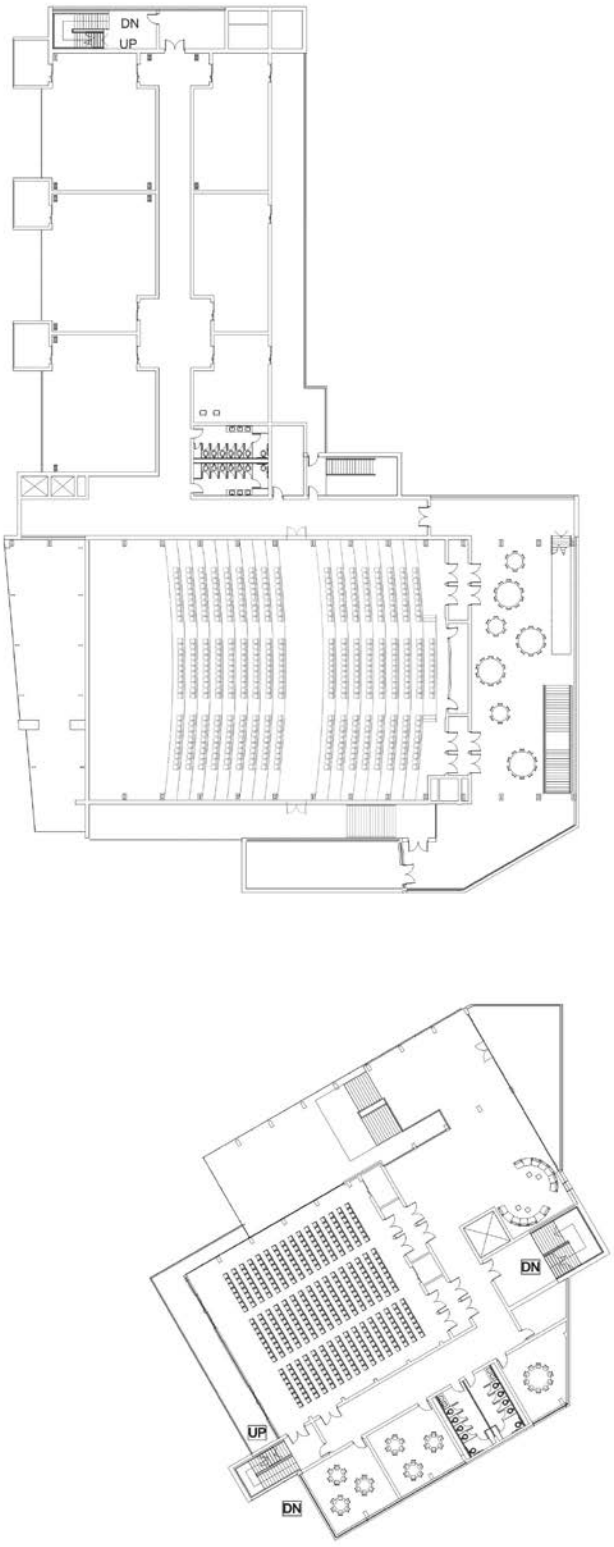

Figure 27. Third Floor (A ‘Second Floor’ only exists in stair landings because of height.)

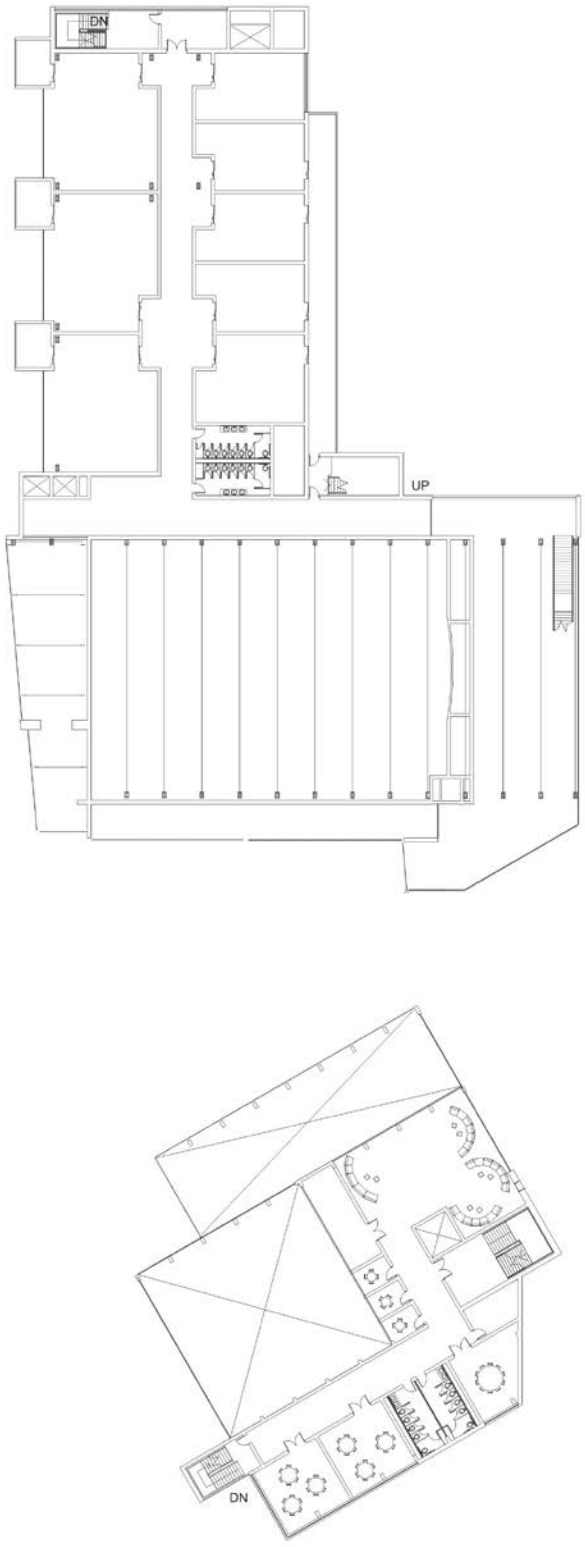

Figure 28. Fourth Floor

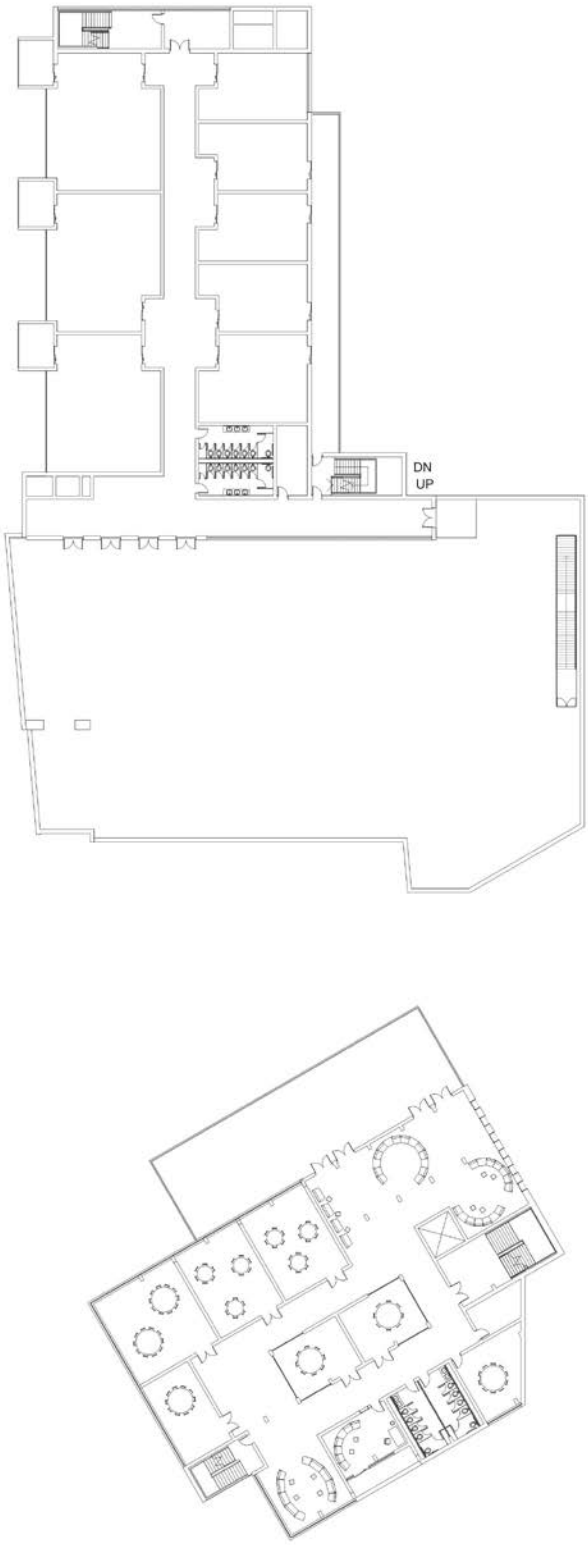

Figure 29. Fifth Floor

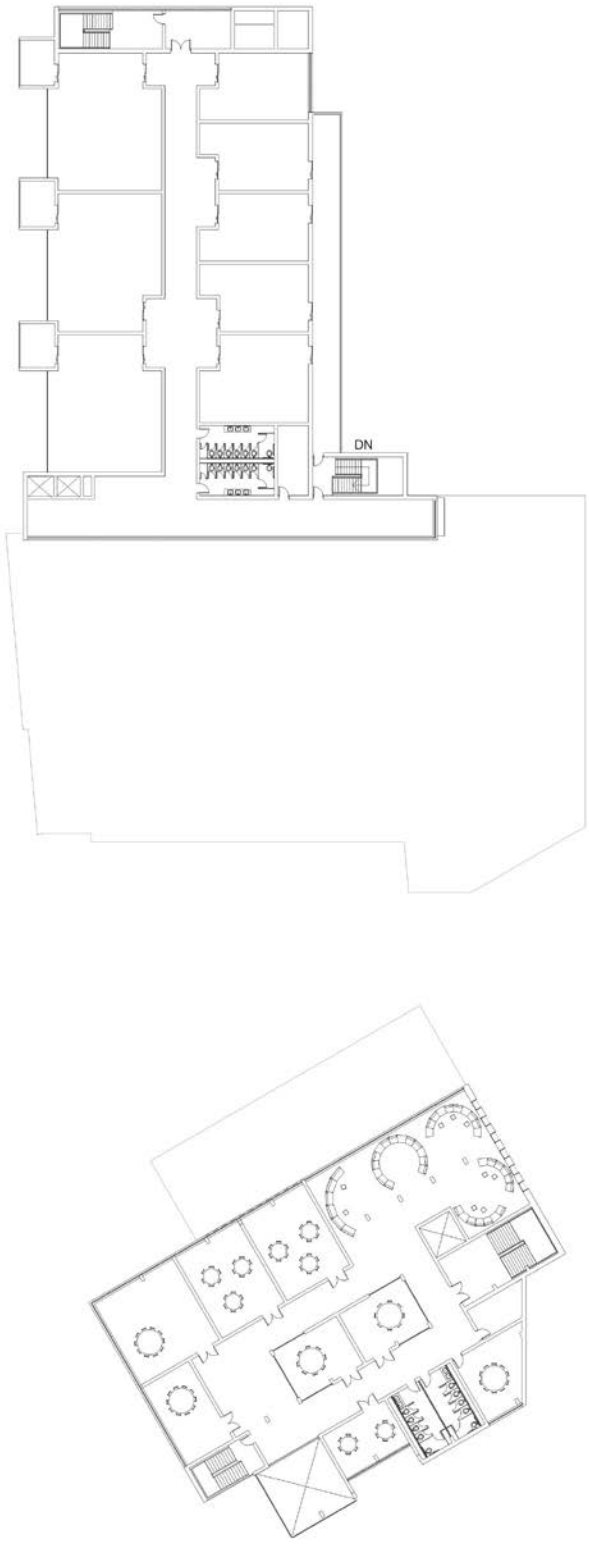

Figure 30. Sixth Floor

Figure 31. Innovation Center – Elevation on 6th Street, N.E.

Figure 32. Community Center – Elevation on 6th Street, N.E.

Figure 33. Gallaudet University – Elevation on Florida Avenue, N.E.

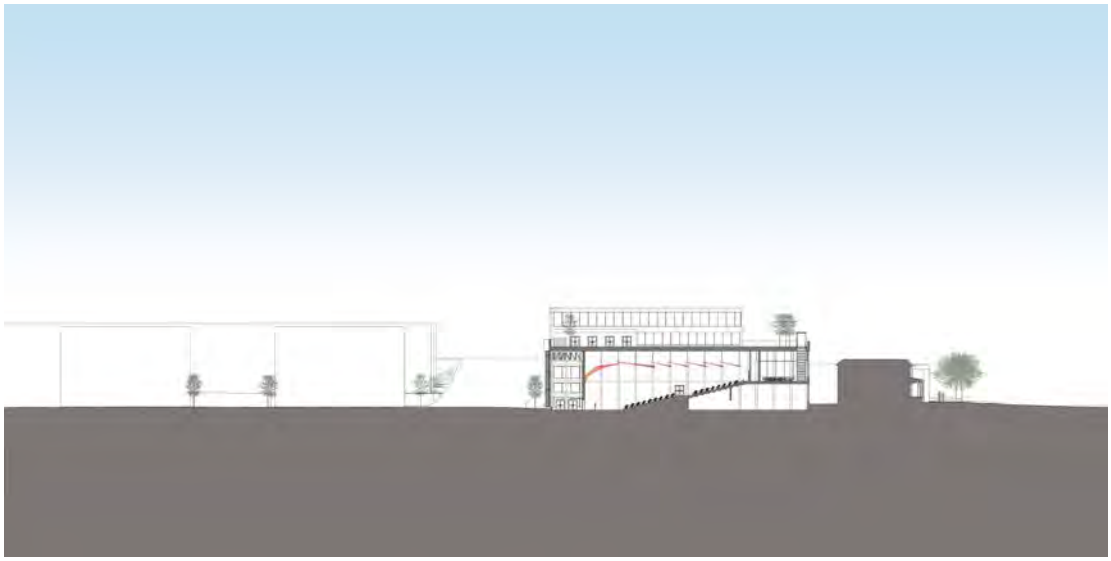

Figure 34. Innovation Center – Section through Lecture Hall

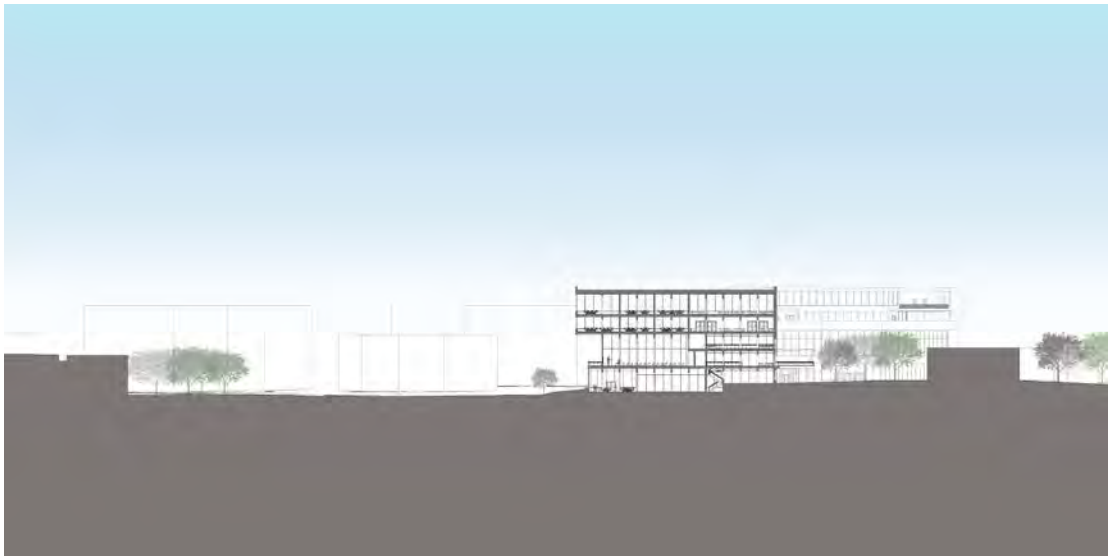

Figure 35. Community Center – Section through Meeting Room

Figure 36. Community Center – Section through Lobby and across Olmsted Green

Section 3: Addressing Engagement Priorities

The pair of proposed buildings strives to address the engagement priorities established earlier in this paper. The buildings are designed to bring campus community and neighborhood together through a mixture of spaces that accommodate different types of interaction from solitary observation and intimate conversations to large group engagement and performance. Unlike the mix-use spaces proposed for the lots south of Union Market on the opposite side of 6th Street, NE and different from the academic spaces on campus, the pair of buildings provides something unique. With places to learn and engage at different levels such as in community signing classes or in an innovation lab, the boundary of communication between campus and neighborhood is unlocked. Should Gallaudet pursue this type of building strategy on its campus, it has a large task in how to program the space to engage neighborhood and campus community but the multitude of spaces will easily accommodate a range of activities to change the intangible boundary of Gallaudet.

Section 4: Connecting Lynch and Zucker to the Design

Lynch's *The Image of the City*, was introduced earlier in this thesis because it helped to define boundary. In some cases, Lynch's city elements can be applied to this design. For example, the paths through the plan are clear and understandable. Similarly, the idea of landmark can be applied to the various facades of the buildings and their relationship to the city and the campus, seen in both diagrams and elevation studies. At a larger scale, the site plan proposes a stronger campus edge through buildings but the edges of the buildings are hard to understand at the building scale. Also, the various nodes seem to apply to different areas of the site while districts seem to broad. It could be argued that the Innovation Backyard is a different district as the Community Center but that would be stretching the idea. To

conclude the use of Lynch, the city elements must be scaled throughout design and not to a specific moment.

Zucker's (1970) *Town and Square* helps to define the site specific spatial relationship between the two buildings and the surrounding campus buildings. Zucker was not introduced earlier in the literature review because his typologies seemed both more appropriate to the final design and they could not be used until the design was established. Zucker's square typologies, Closed Square, Dominated Square, Nuclear Square, Grouped Squares, and Amorphous Square each hold different merits in this design, however, the most successful version of this design favors Grouped Squares. Each pair of diagrams suggests a different type of square arrangement within the design, with the exception of the Amorphous Square which proved somewhat impossible to diagram in the abstract. The Grouped Squares made most sense because of their leaky nature and variety of spaces to gather between the buildings. Further use of Zucker's square typologies on campus organization is merited.

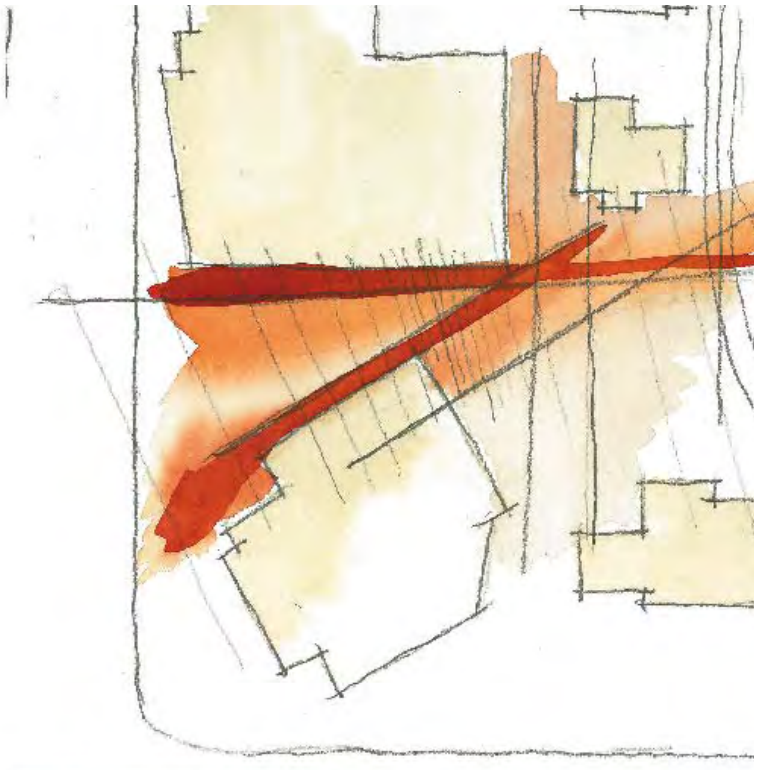

Figure 37. Paths in Design

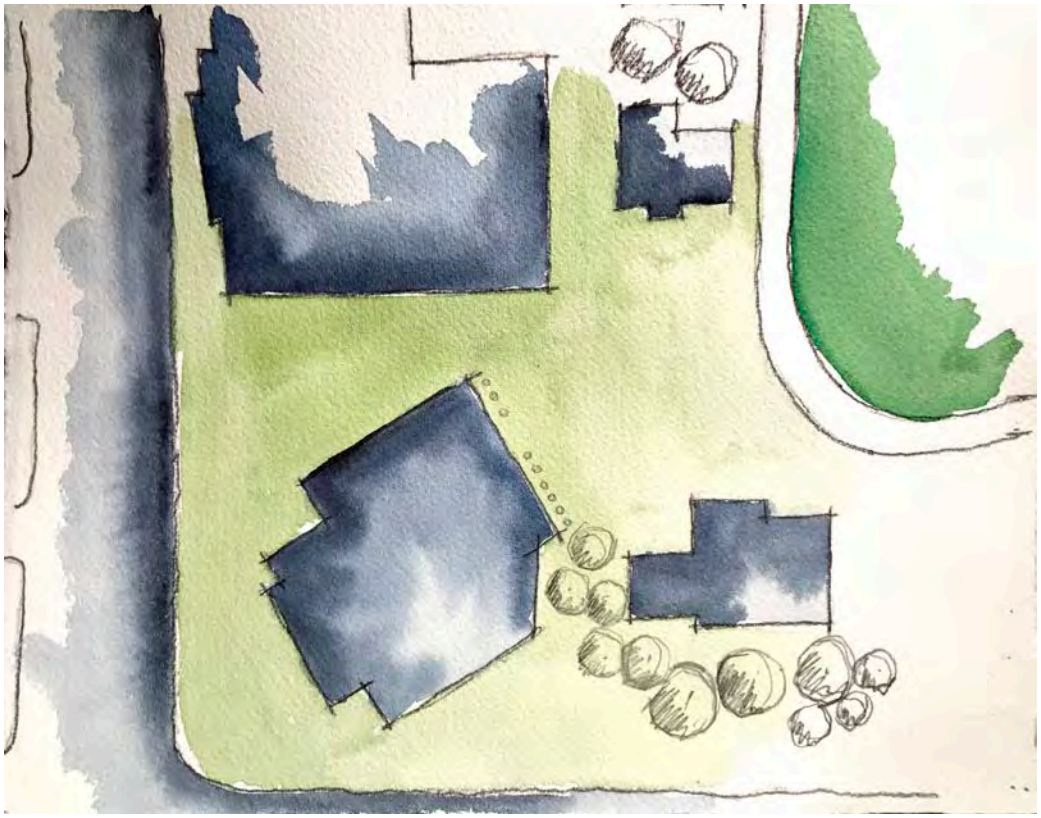

Figure 38. Edge in Design

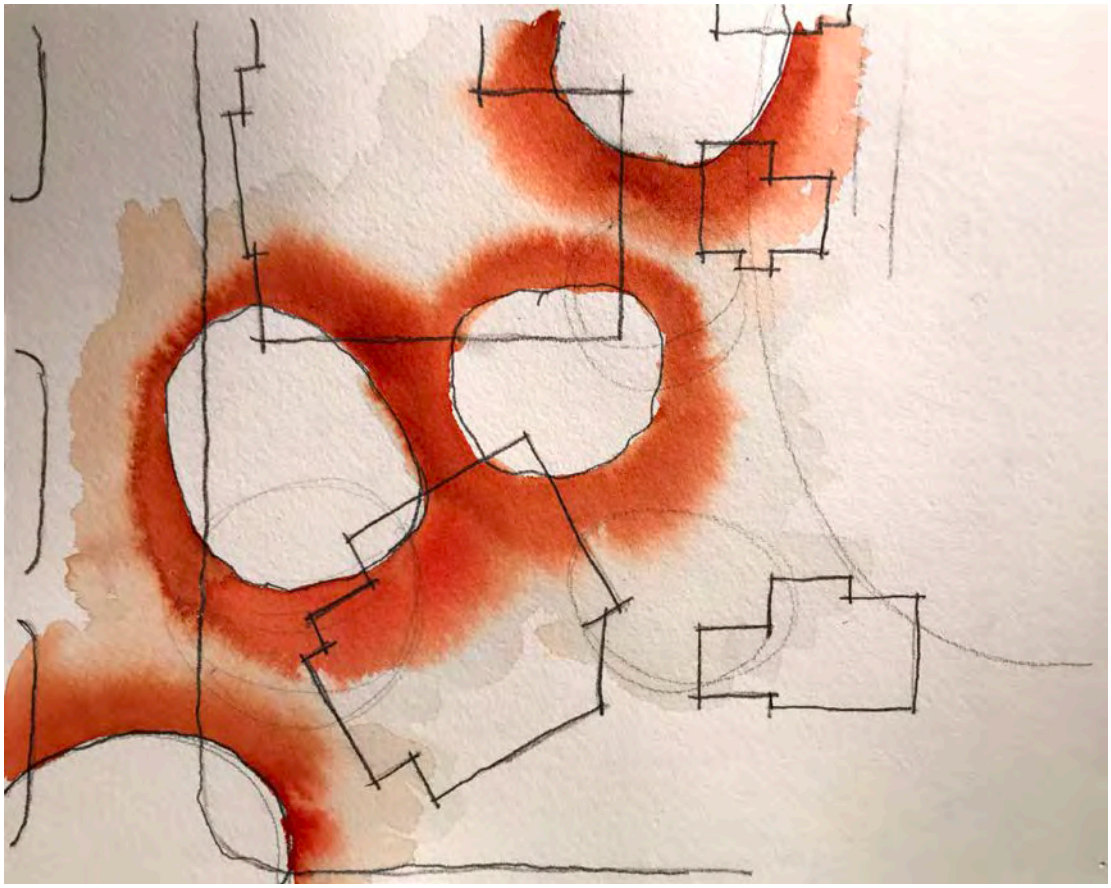

Figure 39. District in Design

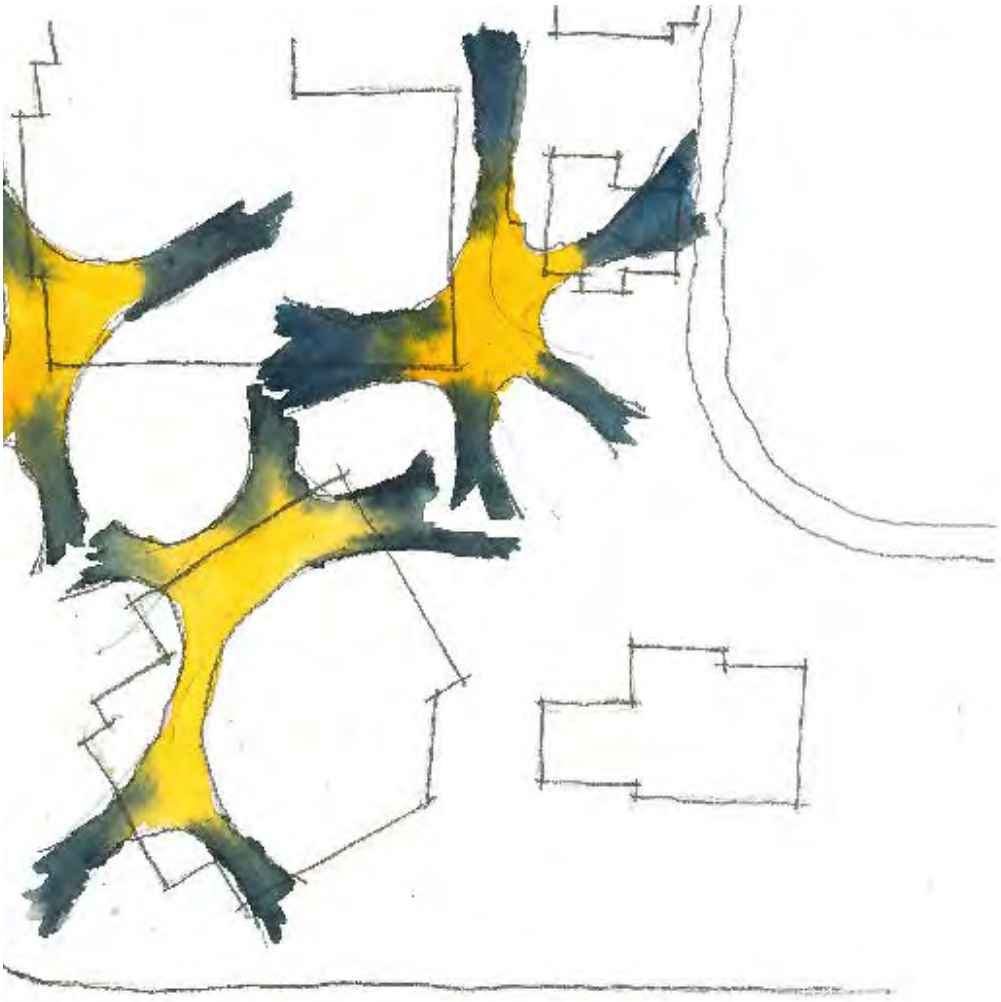

Figure 40. Node in Design

Figure 41. Landmark in Design

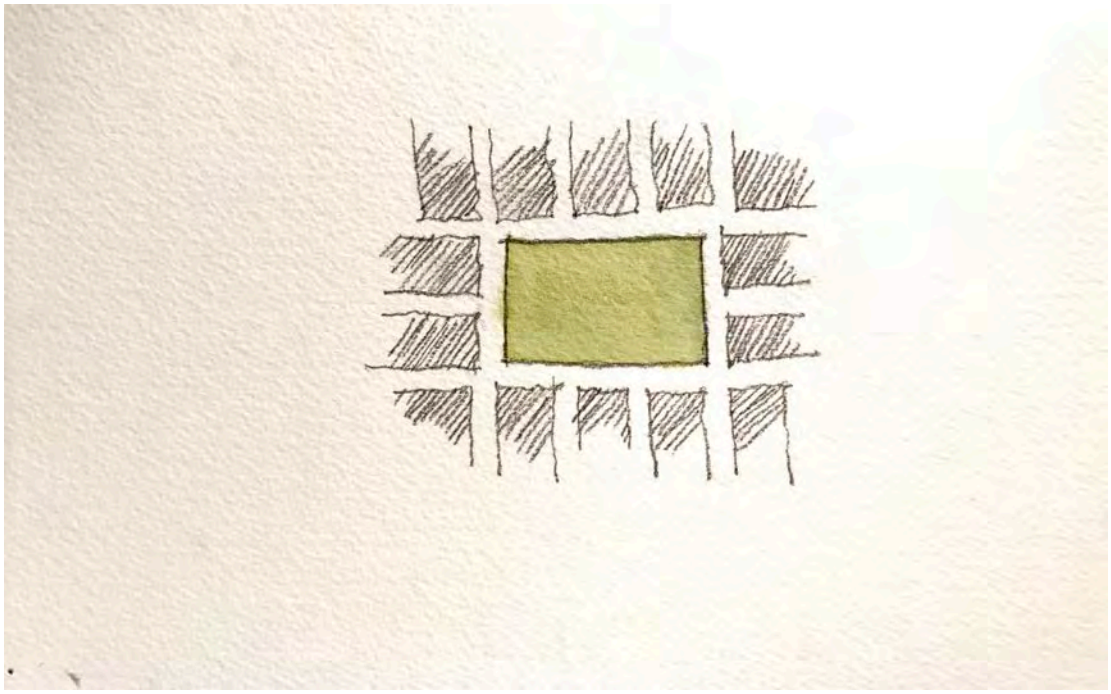

Figure 42. Closed Square – Abstract

Figure 43. Closed Square – Design

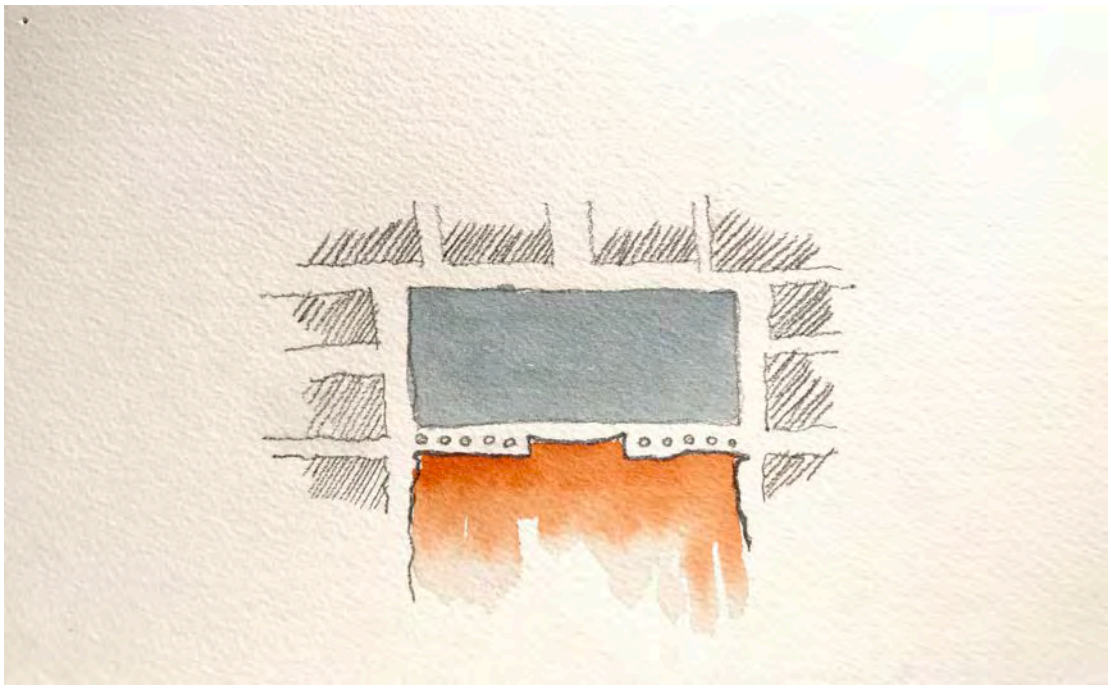

Figure 44. Dominant Square – Abstract

Figure 45. Dominant Square – Design

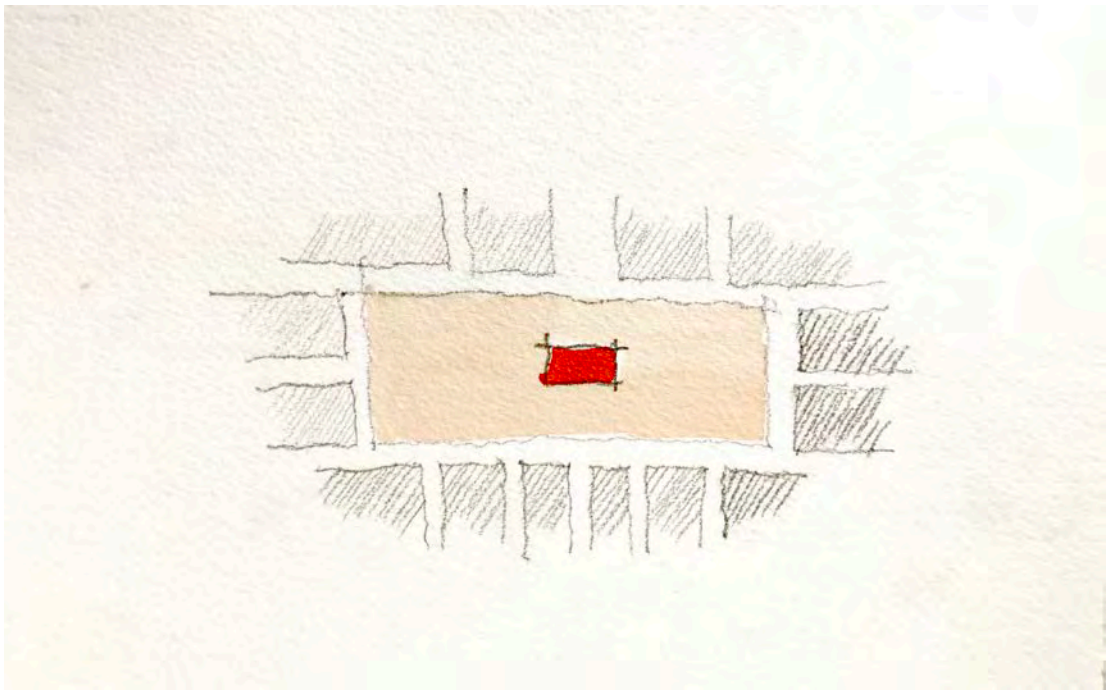

Figure 46. Nuclear Square – Abstract

Figure 47. Nuclear Square - Design

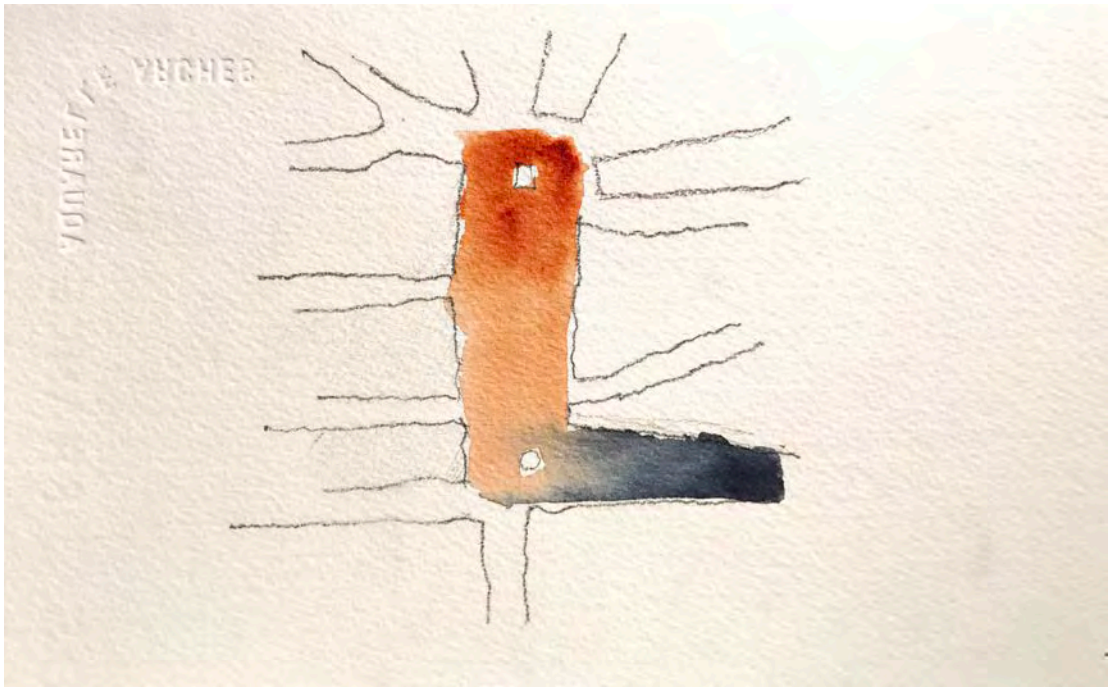

Figure 48. Grouped Squares – Abstract

Figure 49. Grouped Squares -Design

Figure 50. Amorphous Square - Design

Chapter 5: Conclusion

Gallaudet University provided an ideal situation to explore how the university campus boundary worked. However, between the complexity of the institution and its community, the history of campus design, and the concept of boundary itself, the scope of this thesis lacked enough boundary to maintain manageable parameters of study. There are many areas barely touched upon in this thesis that should be further explored. Fortunately, Gallaudet University has the opportunity to develop this site and it can stand as an example for campus designers.

Even with examination and careful design, each person defines her own boundary. As Leach writes, each person develops a boundary based on her own cultural experiences. When architects approach the university campus boundary, they must design a multitude of boundary moments in a single instances and let the user find her own moment of boundary from which she steps of campus and out into the world.

Figure 51. Abstract Model Study of Boundary

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