

ABSTRACT

Title of thesis: A STREAM RUNS THROUGH IT:
RECONNECTING WATERSHED AND LANDSCAPE
AT THE UNIVERSITY OF MARYLAND

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This thesis will investigate roles that the built environment can play in restoring the urban watershed and reconnecting a community with the landscape sheltering that watershed. The focus of this investigation is Campus Creek, a stream that traverses the width of the University of Maryland, College Park campus. Until now the creek has been utilized primarily to drain storm water from adjacent paved surfaces, resulting in an eroding streambed rendered all but invisible by chain link fence, trash and dense undergrowth.

The revival of the stream and adjacent ecosystems will be accompanied by the introduction of structures that strive to emulate the natural systems they displace, and invite exploration of the environment while protecting sensitive resources. Habitation of the landscape will be sponsored by a set of buildings housing an interdisciplinary environmental sciences program, and by recreational uses located along the waterway. Campus Creek and the slopes north and south of its western section comprise the thesis site.

**A STREAM RUNS THROUGH IT:
RECONNECTING WATERSHED AND LANDSCAPE
AT THE UNIVERSITY OF MARYLAND**

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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For my parents, Marcia and Walter Bauer

Thank you.

ACKNOWLEDGMENTS

The list of people whose help I have received
along the way is quite a long one.
Though I won't try to mention you all by name,
my heartfelt gratitude is due to each of you
for your unique contributions.

Together with my committee, whose endurance and good will
I've put to the test over a number of semesters,
I especially want to thank
my family and my friend Kathleen Thro.

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CHAPTER 1

CONNECTING ARCHITECTURE AND NATURE

Today's naturalism is dominated by the effects of scientific progress. The imitation of nature finds its models in the dizzying realm of biotechnological microcosms, the macrocosms of astrophysics, the enigmas of fractal modularity, the exponential complexity of artificial intelligence, the layerings of genetic manipulation.

In these cases we, the planetary audience hooked on strong emotions, want excess, transgression, paradox, escape. But alongside the most astonishing installation or the most reckless work of architecture we see a little elementary construction, made of branches or stones, delicately placed at the edge of an uncontaminated forest. We've changed channels, the special high-tech effects vanish, and we are left with a few simple, measured gestures, in direct contact with nature, in a lively dialogue with landscape. In this region what counts is the here and now, the seasons, light and darkness, the consistency of logs and stones, the sounds of the woods.

Alessandro Rocca¹

This thesis began as a search for a way to study the relationship between architecture and nature in a contemporary context. Our era has witnessed the mounting expectation that architecture will conscientiously mitigate its impact on the natural world. It will provide us a sense of place that has been taken away by multiplying virtual realities and the obscuring mask of corporate identity. It will express the spirit of the age, at the same time providing us bodily and spiritual comfort that we instinctively crave in our dwellings, whether or not we know its sources. And it will make the best possible use of resource-conserving, life-enhancing technology.

As the quote above describes, we live with the sense that the necessary, and sometimes fascinating complications that fill our lives are reduced to their rightful places when we

¹ Rocca, Alessandro. Natural Architecture. p, 9.

encounter the effects that nature achieves with so little means. At the same time, events periodically remind us that ungovernable forces are bound up in the mystery and beauty we are drawn to. It is a dangerous world for beings of every species. Over millennia, architecture has been a mediator of these powerful and often opposing forces.

CHAPTER 2

AN OVERLOOKED CORNER OF CAMPUS

DESCRIBING THE SITE

HISTORY OF CAMPUS GROWTH

THE 2000 FACILITIES MASTER PLAN

SITE ANALYSIS

DESCRIBING THE SITE

As Figure 2.01 illustrates, the College Park campus of the University of Maryland is located close to the western edge of the Upper Coastal Plain province, just east of the fall line dividing the Coastal Plain province from the Piedmont province. West of the fall line the rocks are harder and older; east of it, they are younger and softer, forming regions with generally low relief. Gently rolling landscapes are occasionally punctuated

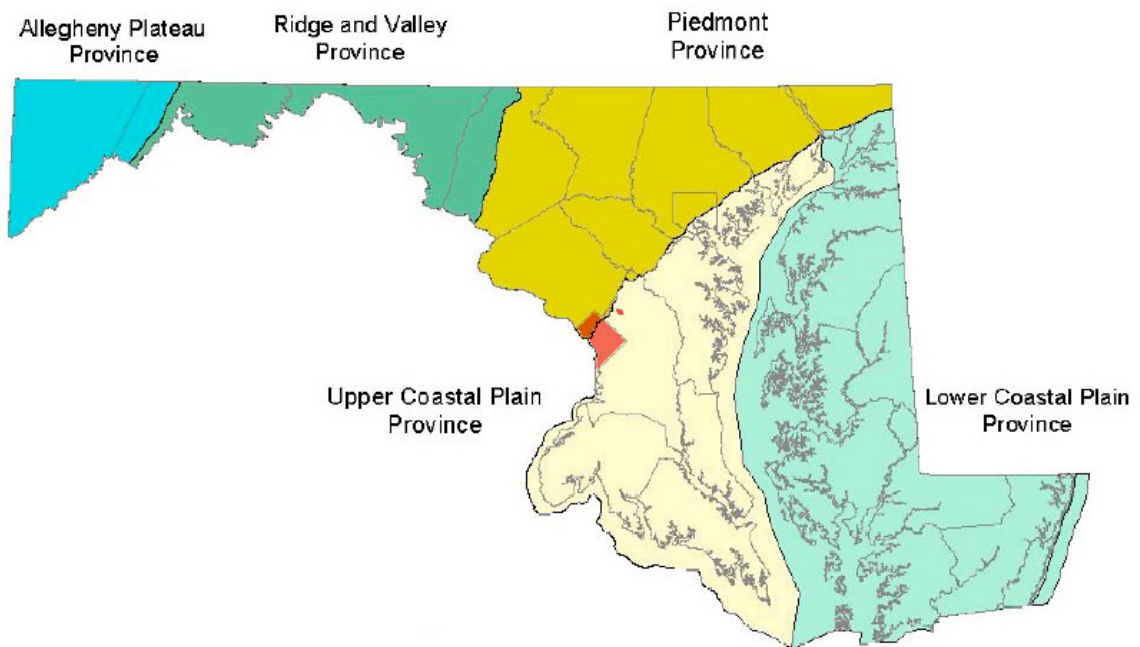


Figure 2.01 The physiographic provinces of Maryland. The areas hatched in red indicate Washington, D.C. and the University of Maryland campus.

(http://www.dnr.state.md.us/wildlife/WCDP_Chapter2_20050926.pdf)

by major hills and ridges that rise 200-300 feet above the surrounding terrain.² The soils comprising these landscapes generally fall into one of two formations, the Patuxent, which is predominantly sandy, and the Arundel, which is much higher in clay. The soils series found in the flood plain areas of the Paint Branch Creek and its tributaries have

² Shimer, John A. Field Guide to Landforms in the United States. New York: The Macmillan Company, 1972; p. 7.

impeded internal drainage, and seasonally high water tables resting on slowly permeable subsoil horizons or strata.³



Figure 2.xx A fairway on the campus golf course exhibits the gently rolling character of the Coastal Plain; looking south. *(Author)*

Figure 2.xx Near the eastern boundary of the golf course, adjoining University Blvd., a buried section of the drainage pattern reasserts itself. *(Author)*

The headwaters of Campus Creek begin to collect on the grounds of the University golf course, a 245-acre parcel separated from the main body of campus by University Blvd. In some sections of the wooded areas bordering the fairways, runoff flows in small open culverts; in other places it is directed under the fairways via PVC piping. A significant amount of the water is collected in two ponds acting as retention basins, arranged one above the other; overflow causes the water in the lower pond to run over a spillway as shown in Figure 2.05. Drainage ditches that

³ Aesthetic Guidelines, p. C-4



Figure 2.xx The lower pond acting as a retention basin; looking west. (Author)

Figure 2.xx During rains the overflow of the pond comes over this spillway; looking north. (Author)

line both sides of University Blvd. conduct the creek northeast until a point is reached where the creek crosses under the roadway into the main campus.



Figure 2.XX View northeast on University Blvd. showing dip beneath which Campus Creek crosses into the main campus. (Author)

Figure 2.XX The end of the culvert opening on the east, or main campus, side of University Blvd. The creek flows north for a short distance before turning east again. (Author)

The topography of the campus as a whole has been likened to a hand with the fingers wide spread; the fingers represent the tops of ridges that run generally east and west; and the spaces between the fingers identify the ravines that bridge between the ridges. It seems more than likely, based on the very defined course that the creek cuts

through campus, that the ravine along which it travels originally extended back into the golf course, and has been greatly modified by construction of the golf course and the roadway.



Figure 2.XX View north along the drainage ditch on the east side of University Blvd. (*Author*)
Figure 2.XX The creek after it has turned east into campus. (*Author*)

The photograph in Figure 2.XX above was taken at the bottom of the drainage ditch, which is 12 –14 feet below the level of the roadbed. From the south, at grade level, an observer would have to have prior knowledge of the creek's location, or be very adept at interpreting vegetation and land forms (see Figures 2.XX and 2.XX.) in order to discern its presence. Beyond the chain link fence that barricades the creek up to the east edge of the Campus Recreation Center, leaves, trash, and fallen limbs fill its banks.



Figure 2.XX The Denton Residential Community is in back of the camera viewpoint; the creek is just beyond the line of trees at the edge of the parking lot. *(Author)*

Figure 2.XX One of the northwestern corners of the same parking lot, where the runoff drains down to the creek through a culvert and access is blocked by a locked gate in the chain link fence. *(Author)*



Figure 2.XX View east with the creek on the left, the Campus Recreation Center on the right, and the outdoor climbing equipment straight ahead. *(Author)*

Figure 2.XX The pedestrian bridge at the east end of the Campus Recreation Center, taken from the north side of the creek. *(Author)*

Shown in figure 2.XX is one of several retention ponds that border Campus Creek as it flows eastward. The grade differential between the top of the bank and the streambed becomes more and more moderate, until at the pedestrian bridge pictured above the streambed is visible.



Figure 2.XX From the Stadium Parking Garage, Campus Creek resembles the typical waterway passing through an agrarian landscape – as in fact it did for at least a century. *(Author)*
 Figure 2.XX A view of the pedestrian bridge connecting the Cambridge Community dorms with the Comcast Center. *(Author)*

The grade at this point in the creek’s progress is steepest on the north side, this condition can be noted in Figure 2.XX above. There are at least two retention ponds along this stretch to intercept the overland flow of rainwater.



Figure 2.XX Storm water culvert draining the parking lot north of the Agriculture/ Life Sciences Surge Blvd. *(Author)*
 Figure 2.XX Looking west across Paint Branch Creek to the point where Campus Creek flows into it. *(Author)*

As it passes under Paint Branch Drive, the creek has been threading its way between parking lots on the north, and engineering and science buildings on the south. An inconspicuous path connecting the easternmost parking lots with the new high-rise apartments on Route 1 accompanies its final passage to union with Paint Branch Creek.

Overall, the creek appears to be much more eroded in the western sections, before it reaches the Comcast Parking Garage footbridge. Whether there is in fact a marked difference in environmental condition between these sections and the more gravelly and vegetated portions to the east cannot be determined by this observer. What is clear is that the creek is considerably more visible to the pedestrian walking over the footbridges, or following it through one of the eastern parking lots to reach his or her destination. The erasure of the creek's presence by untamed thickets of underbrush and continuous stretches of chain link fence also erase any clear sense of connection that the nearby communities might have to the landscape on its farther side.

THE DEVELOPMENT OF THE COLLEGE PARK CAMPUS

The present state of Campus Creek is the result of a history of campus development going back to the circumstances of the University's founding. Clues about what influences might be important to retain and reflect in the thesis design can be gleaned along with an understanding of the degraded conditions that presently exist.

By the time the District of Columbia was established in 1790 on the banks of the Potomac, it was surrounded by well-established farms that had cleared away most of the existing forest. Just a few decades later, the tobacco farmers of Maryland were finding that their cash crop had drastically impoverished the soil, and productivity was failing.⁴ At the same time tobacco prices were falling, the rise of industry was drawing off manpower to urban centers, and there were fewer slaves in residence than in previous decades. Successful farmers such as Charles Benedict Calvert were determined to elevate the beleaguered Maryland farmer's lot through education and the scientific study of crop and livestock production. His gift of 420 acres of farmland to the State of Maryland in 1856, plus the financial investments of other well-to-do landowners, provided the foundation of the Maryland Agricultural College, as it was known then. A single building housing most of the functions of the college was built on a rise overlooking Baltimore Blvd (Rte.1).

The chaos unleashed by the Civil War so soon after the founding of the College put a severe brake on its development through the balance of the nineteenth century and into the twentieth. This suspension is compared with later expansion in a series of diagrams condensing a decade-by-decade chronology that was prepared by the University's Office of Facilities Planning (see Figures 2.xx – 2.xx).

⁴ Callcott, George H. A History of the University of Maryland. Maryland Historical Society, 1966., p. 132.

Early in the twentieth century, institutional growth was propelled by tragedy. A fire on Thanksgiving 1912 destroyed two major campus buildings, the Barracks and the Administration building. The State of Maryland stepped in to rebuild these facilities, and renamed the College the Maryland State College of Agriculture. In the succeeding decades, significant changes in the student body and the broadening of curricular programs were mirrored by the creation of dormitory-style student housing and McKeldin Mall. The influx of former GIs after World War II required temporary structures for housing and classrooms.

The following diagram illustrates the development of buildings on the campus decade by decade.⁵

⁵ Aesthetic Guidelines

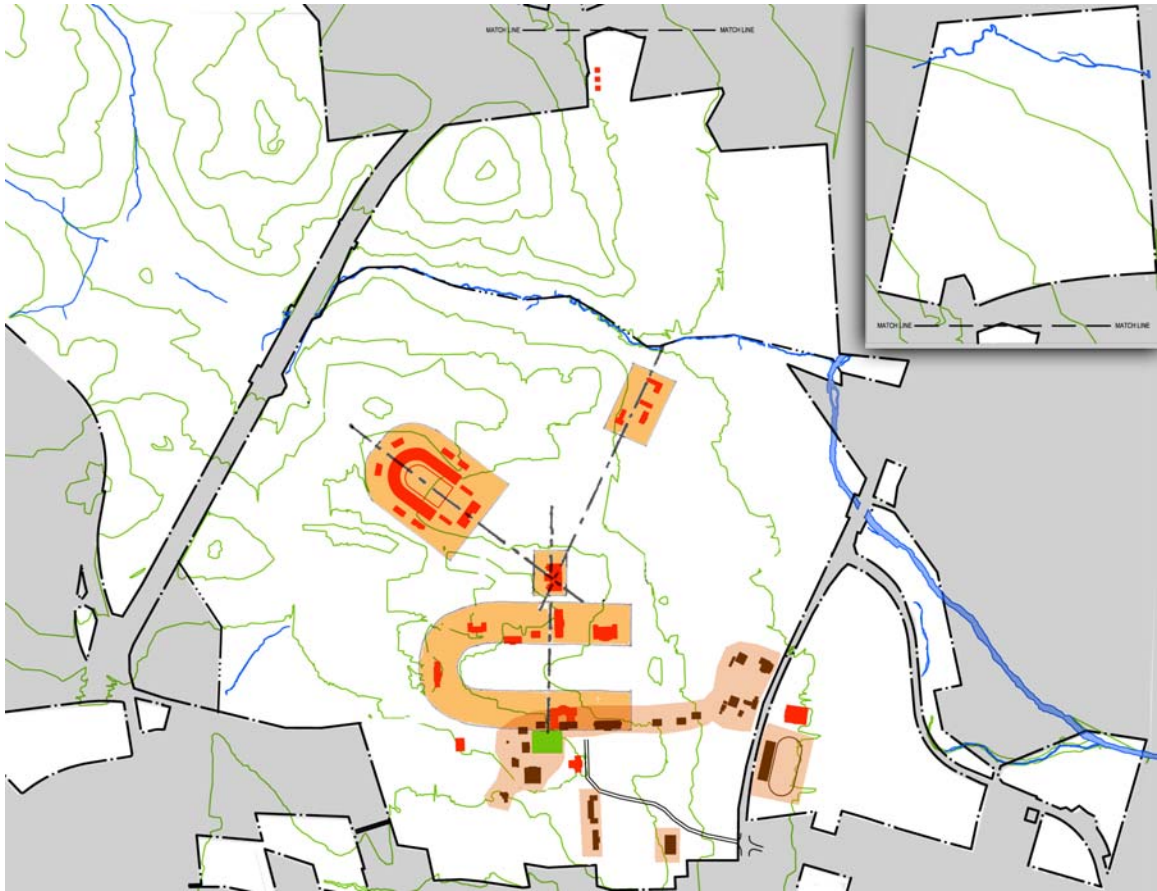


Figure 2.X Campus development between 1856 and 1939. (Author and Facilities Planning)

As shown by the areas shaded in pale red, early development during this period took place in a meandering band between Route 1 and the knoll where the barracks and the original administration building were constructed. In the 1930s, attention turned to the ravine just to the north, and we can see the outline of the Mall beginning to take shape. The federally-funded Microbiology building is the first to be built north of what became known as Campus Drive. Oriented axially to this building are Byrd Stadium and

a group of farm buildings located close to Campus Creek.

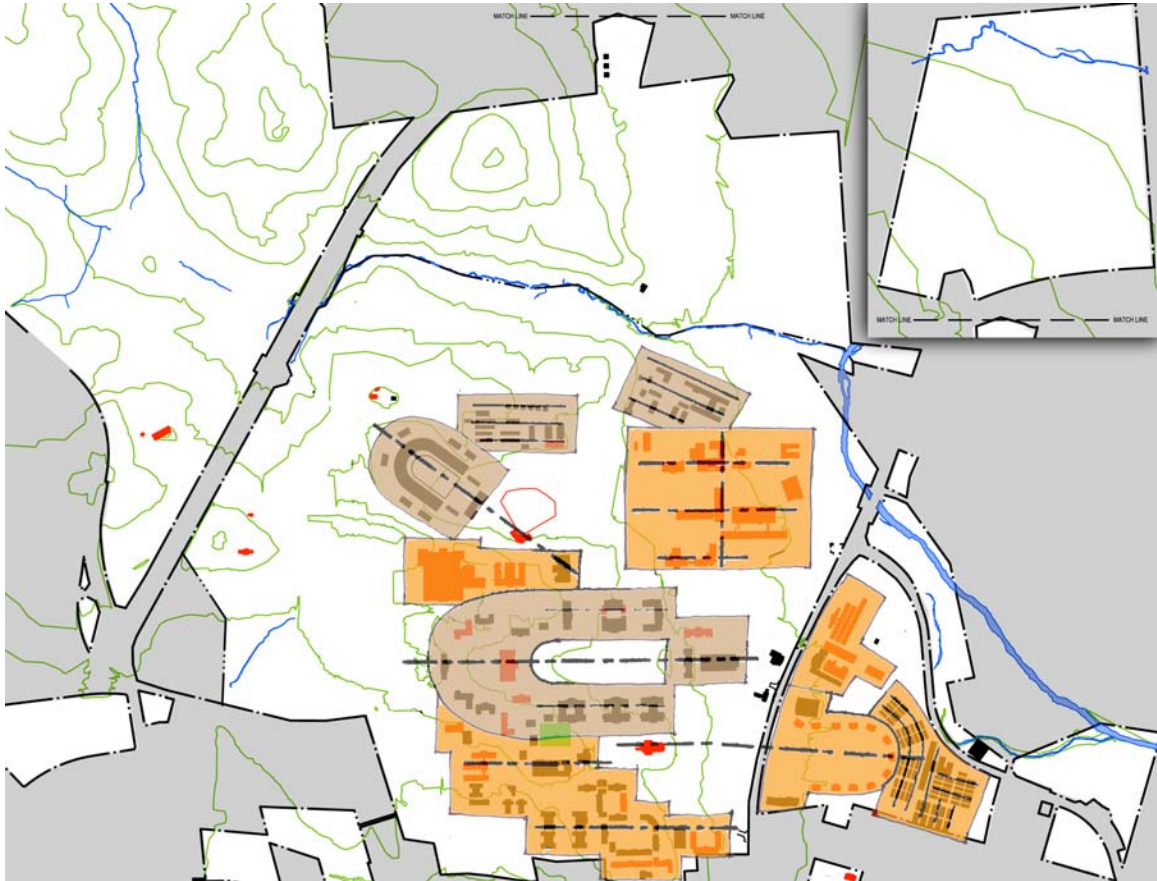


Figure 2.X Campus development between 1940 and 1959. (Author and Facilities Planning)
The diagram highlights axial relationships and alignments in some areas, and points out a dominant grain of the building fabric in others.

After a lull during World War II, the campus population mushroomed. From the first batch of farm buildings, a band of agricultural buildings spreads westward, including a sizeable group of chicken coops in the shadow of Byrd Stadium.

These two decades see the construction of a number of purpose-specific buildings: McKeldin Library, Cole Field House and Stamp Student Union. Two other campus districts take shape during this time: the engineering and science complex to the northeast of the Mall, and student housing developed as quadrangles between the Mall and the southern edge of campus.

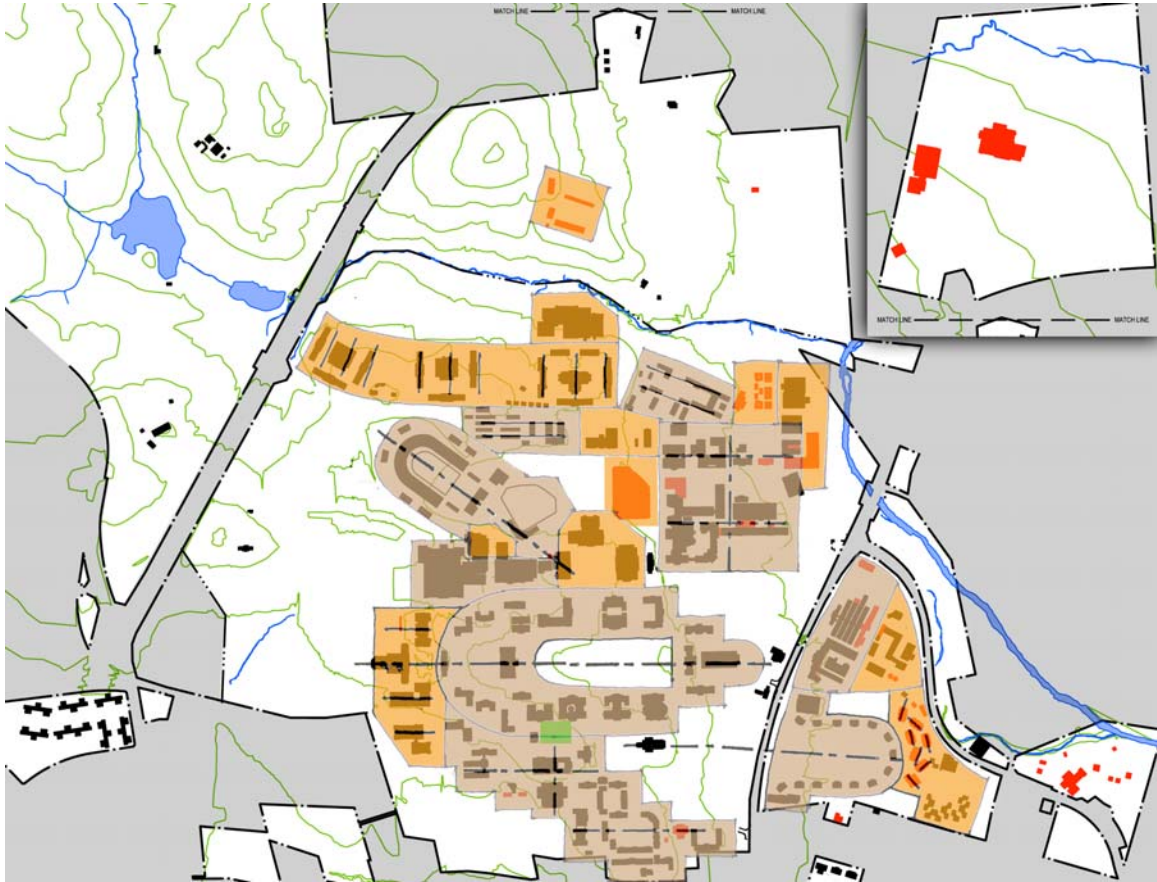


Figure 2.X Campus development between 1960 and 1989.

On-campus housing continued to grow in these two decades, though not in proportion to the student population, 70% of whom are commuters in 1973⁶ In addition to East Campus, which has now received permanent residential buildings, a dramatic series of three eight-story complexes rises in an east-west swathe north of the chicken coops. The Health and Human Performance built in 1973, is now the structure closest to Campus Creek. A set of maintenance buildings makes its appearance north of the creek.

Other areas of campus see significant consolidation and infill.

⁶ Richardson, Severns, Scheeler, Associates, Inc.

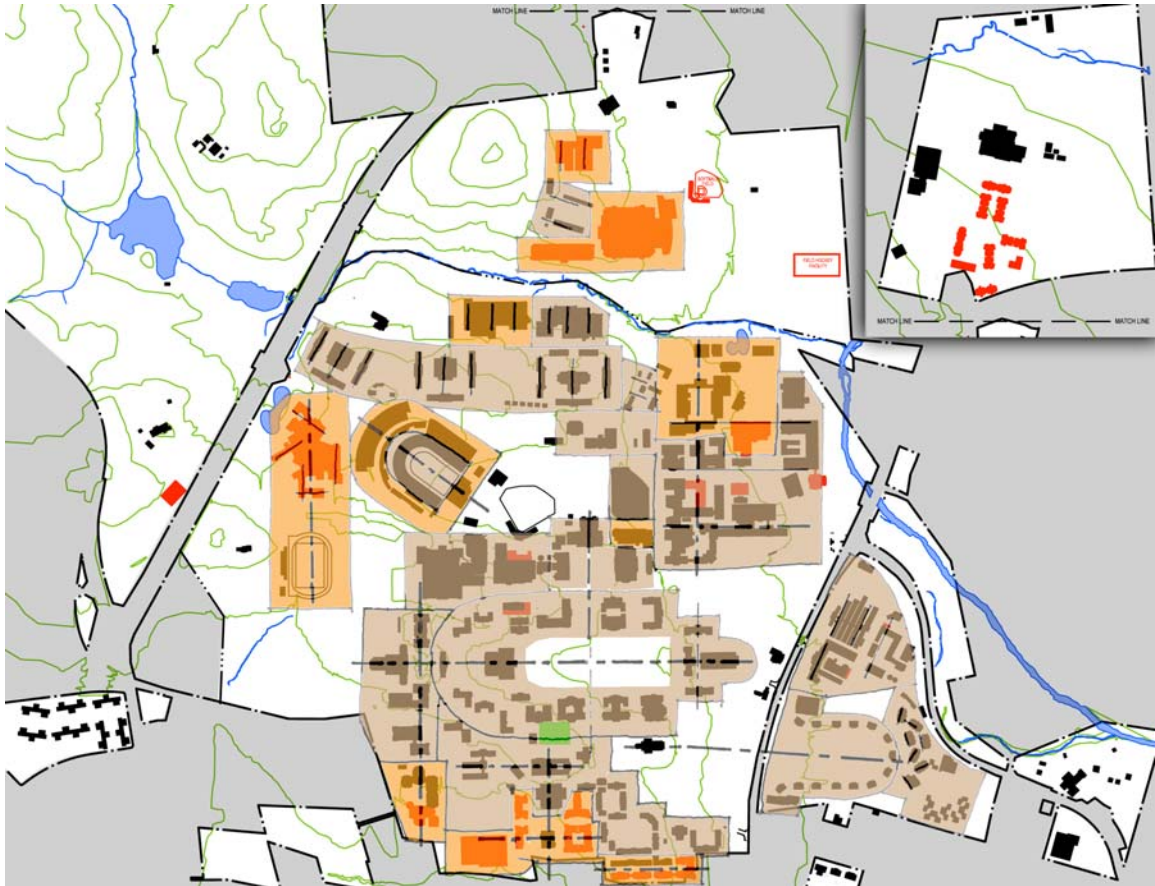


Figure 2.X Campus development between 1990 and 2003.

Growth during these decades can be seen as “expansion at the edges”. The early 21st century sees the construction north of Campus Creek of the Comcast Center, the largest enclosed building on campus. This event has major consequences for the creek: the garage that serves the Center and its access road cut the creek off from the Wooded Hillock to the north. The Campus Recreation Center impinges on the creek from the south.

In this highly-accelerated journey through the decades of development, a persistent desire for classical ordering of buildings in the landscape, based on axes, symmetry, and alignment has manifested itself. At the same time, a casual, almost circumstantial distribution of development has emerged, much as farm complexes might evolve.



Figure 2.xx The Roger Dauber farm in outstate Maryland (Library of Congress)

This casual approach might have had some picturesque qualities in keeping with the University's historical roots. However, lack of a consistent planning process has produced cramped public spaces in some areas of campus and cavernous green lawns in others. Pedestrian paths routinely disappear into circumscribed parking lots. The University is making striving to make headway against the onslaught of cars, but large swaths of ground in the heart of campus are devoted to parking, cheek and jowl with otherwise respectable academic buildings.

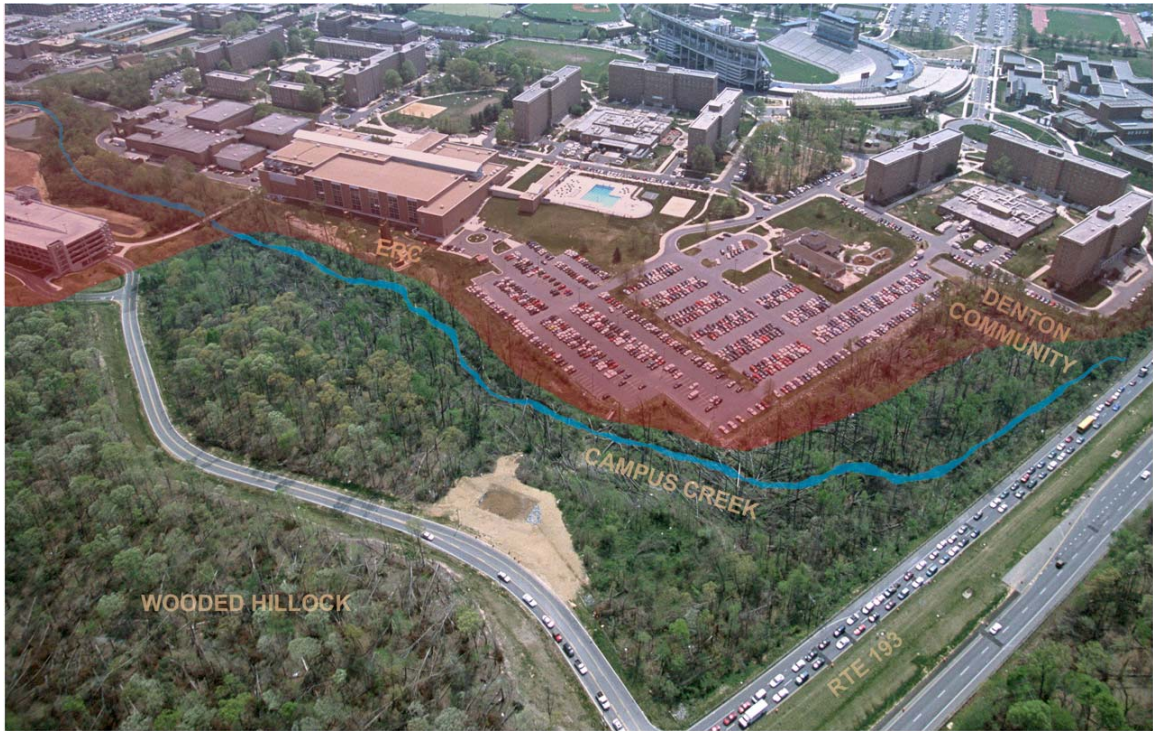


Figure 2.xx Aerial view of thesis site from the north, with the current edge of campus development highlighted in red.

Of greatest impact on Campus Creek is the degree to which buildings and the aforesaid parking have come within close proximity to its banks. The environmental damage that has occurred will be described in the next chapter. In terms of the campus community's connection to the landscape, this development pattern turns its back on the creek and recreates it as a barrier, something to be subdued for the sake of enlarging campus facilities, rather than as an asset to be woven into them. This thesis proposes to see if the pattern can be altered for the better.

SITE ANALYSIS

REGION DISTRICT OF COLUMBIA METROPOLITAN AREA

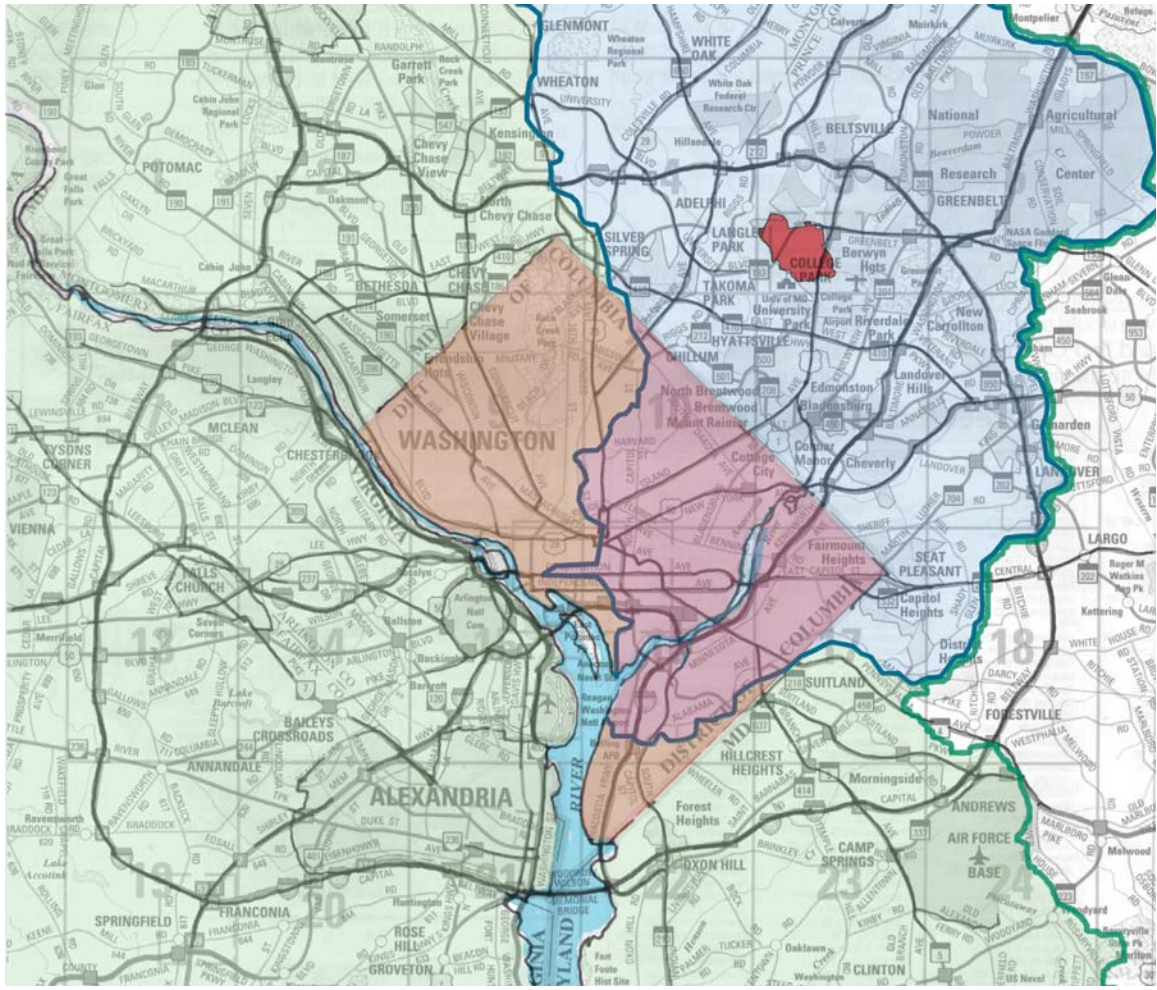


Figure 2.XX (Author)

DISTRICT WATERSHEDS

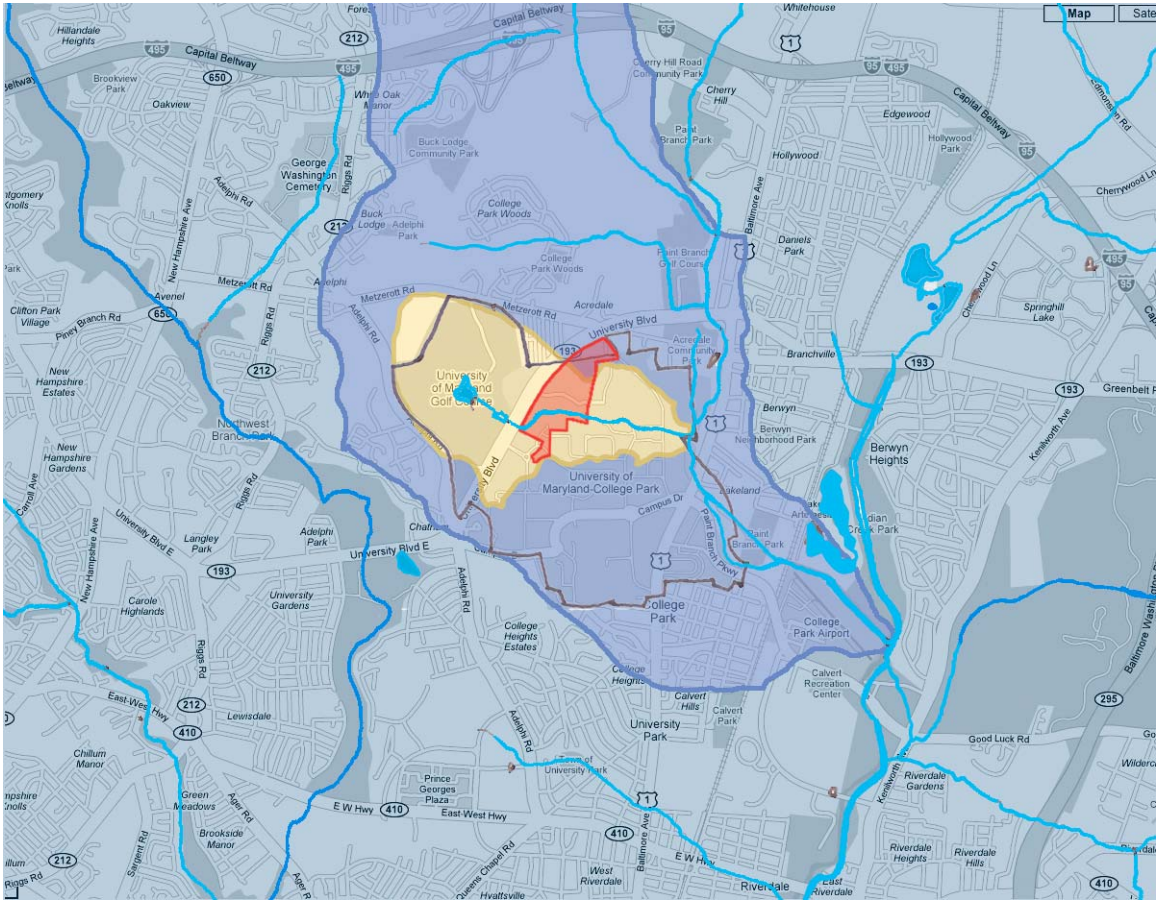


Figure 2.XX (Author)

DISTRICT

GREENWAYS

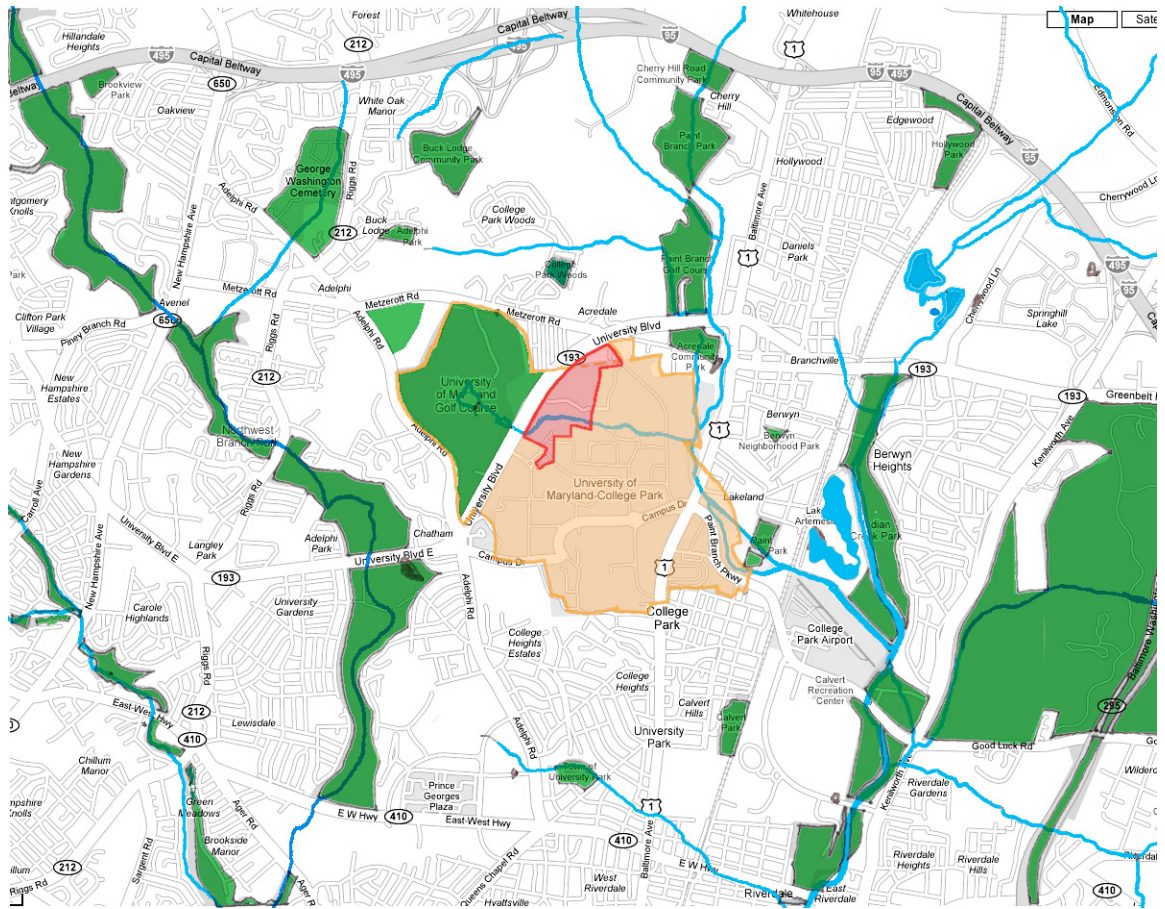


Figure 2.XX (Author)

DISTRICT TRANSPORTATION

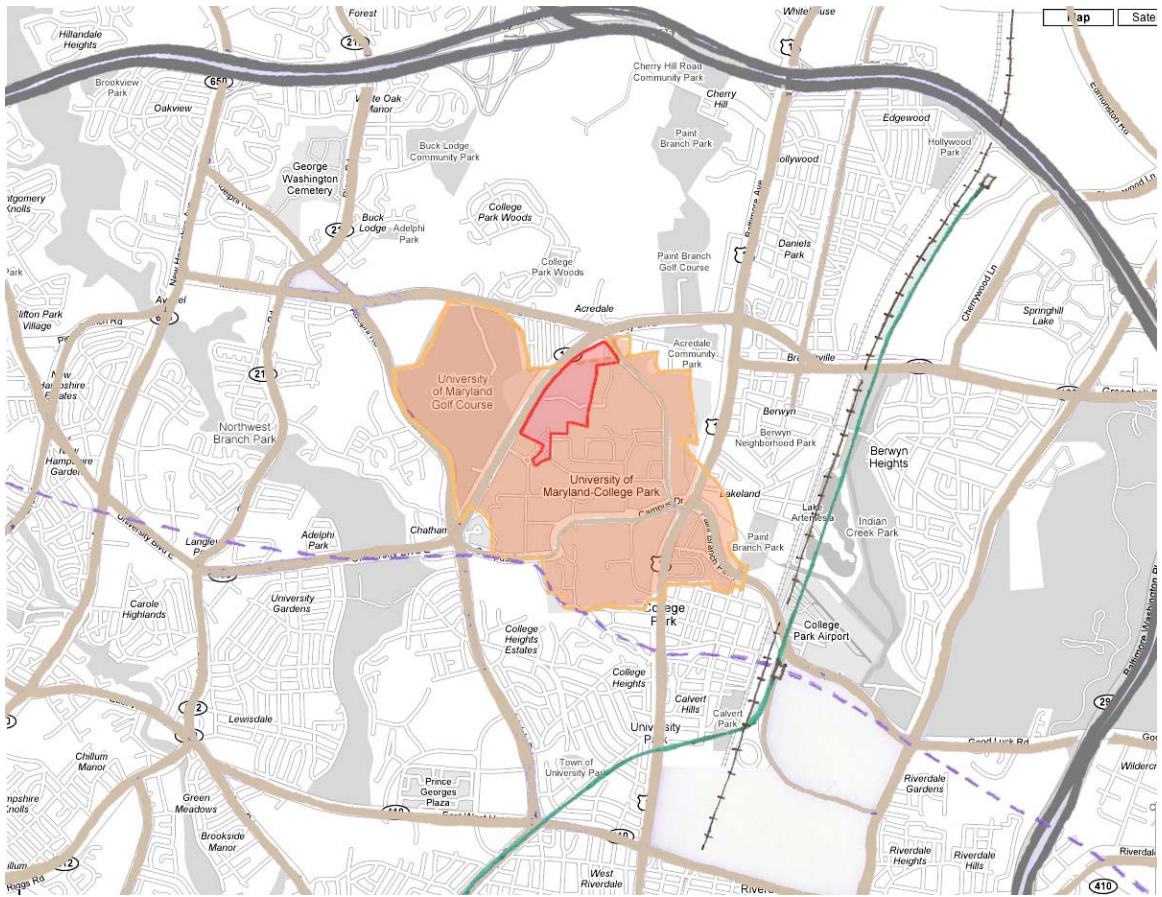


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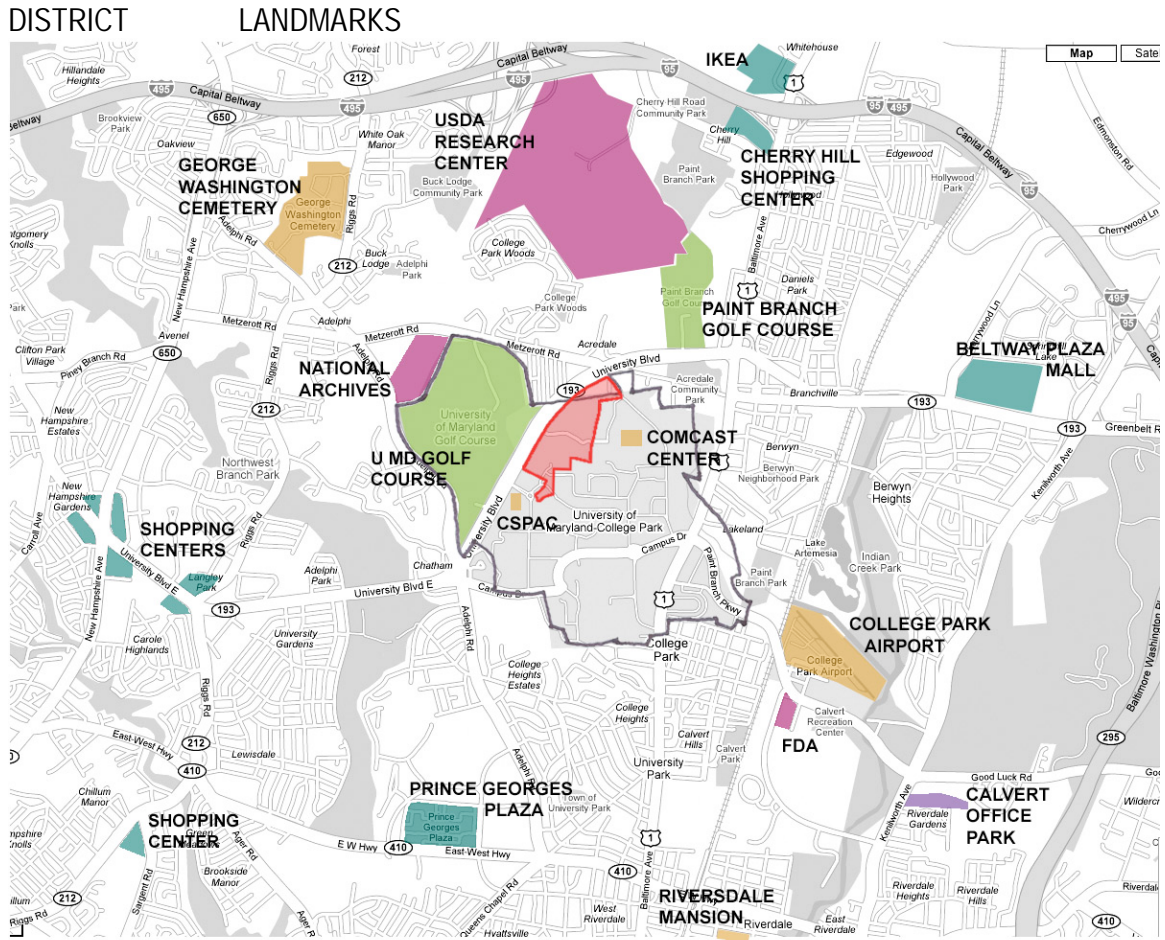


Figure 2.XX (Author)

CAMPUS

WATERSHEDS

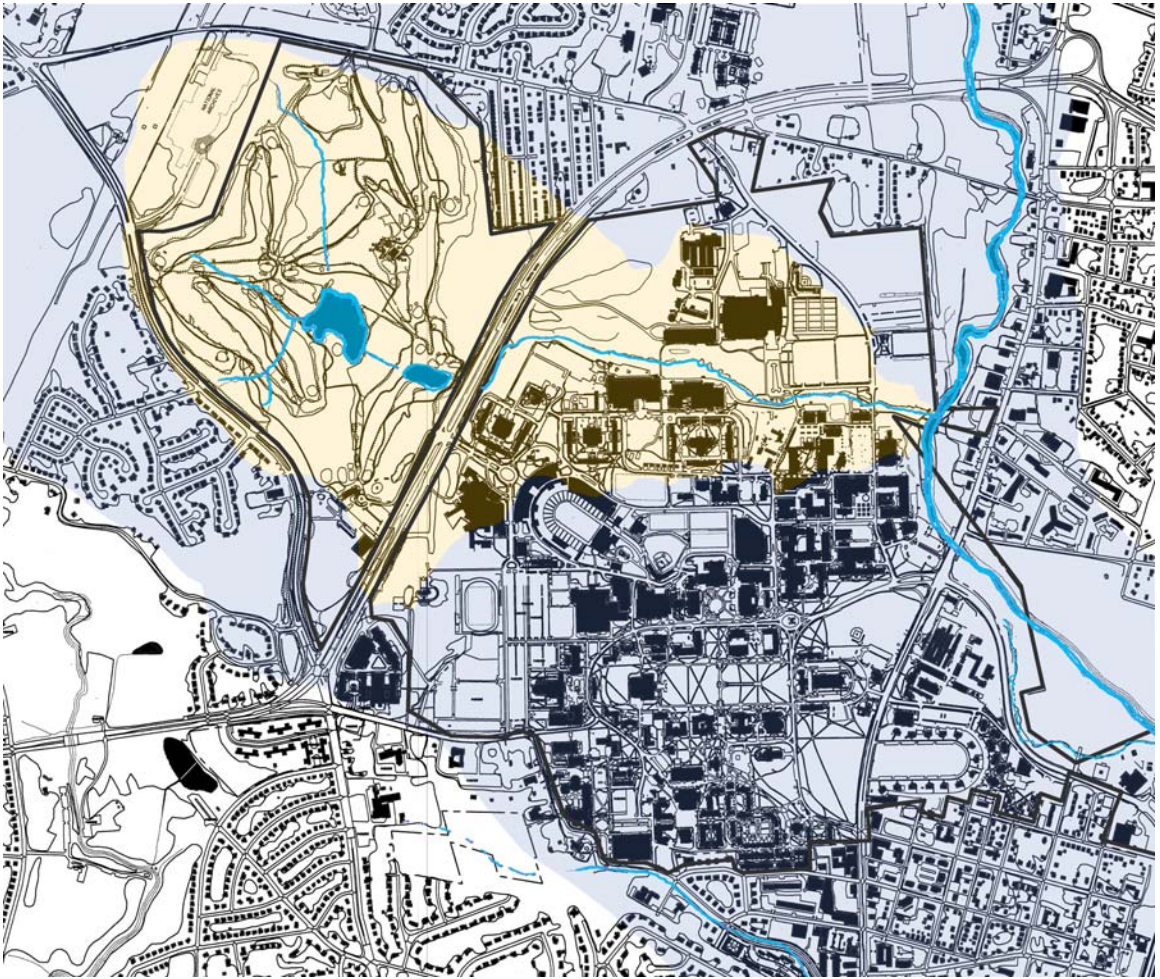


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CAMPUS

FIGURE/ GROUND

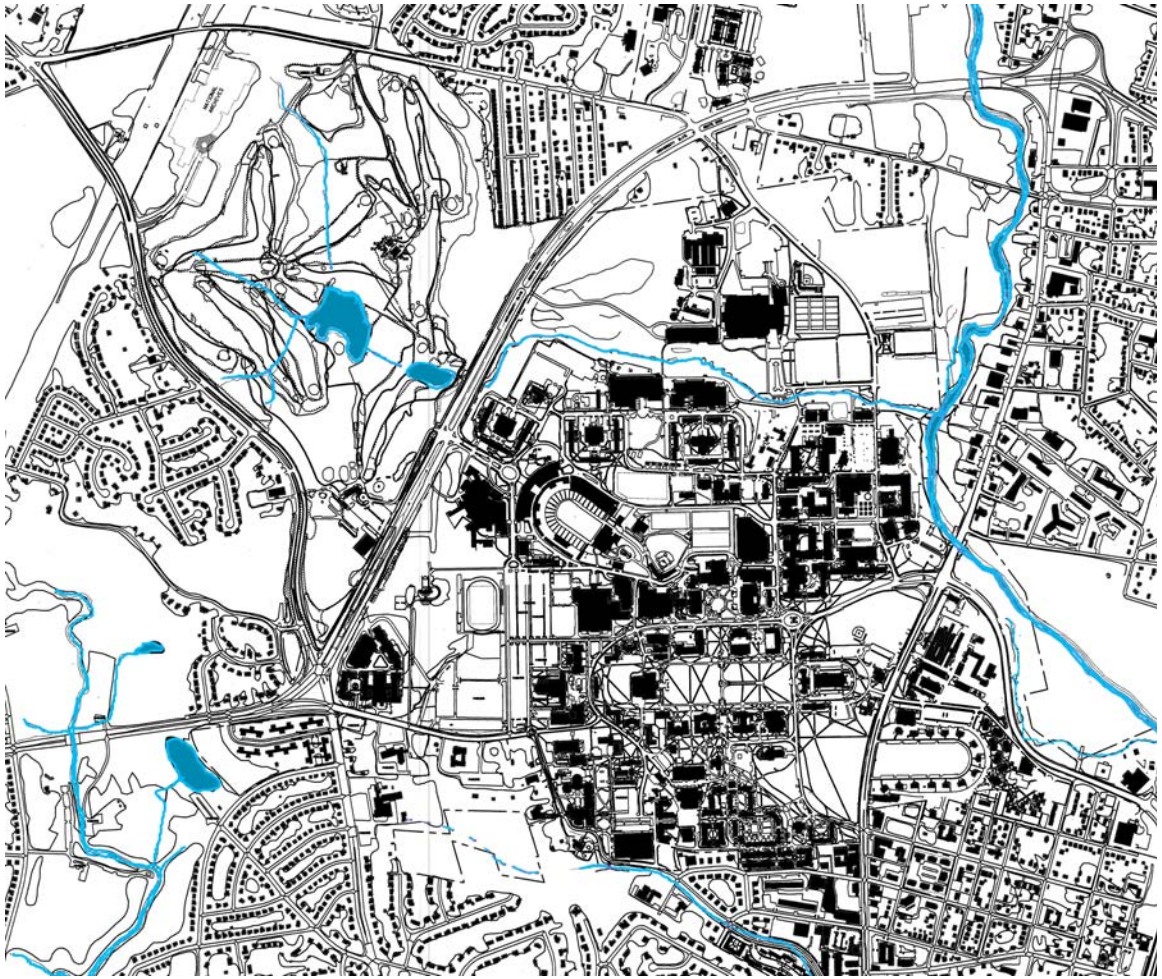


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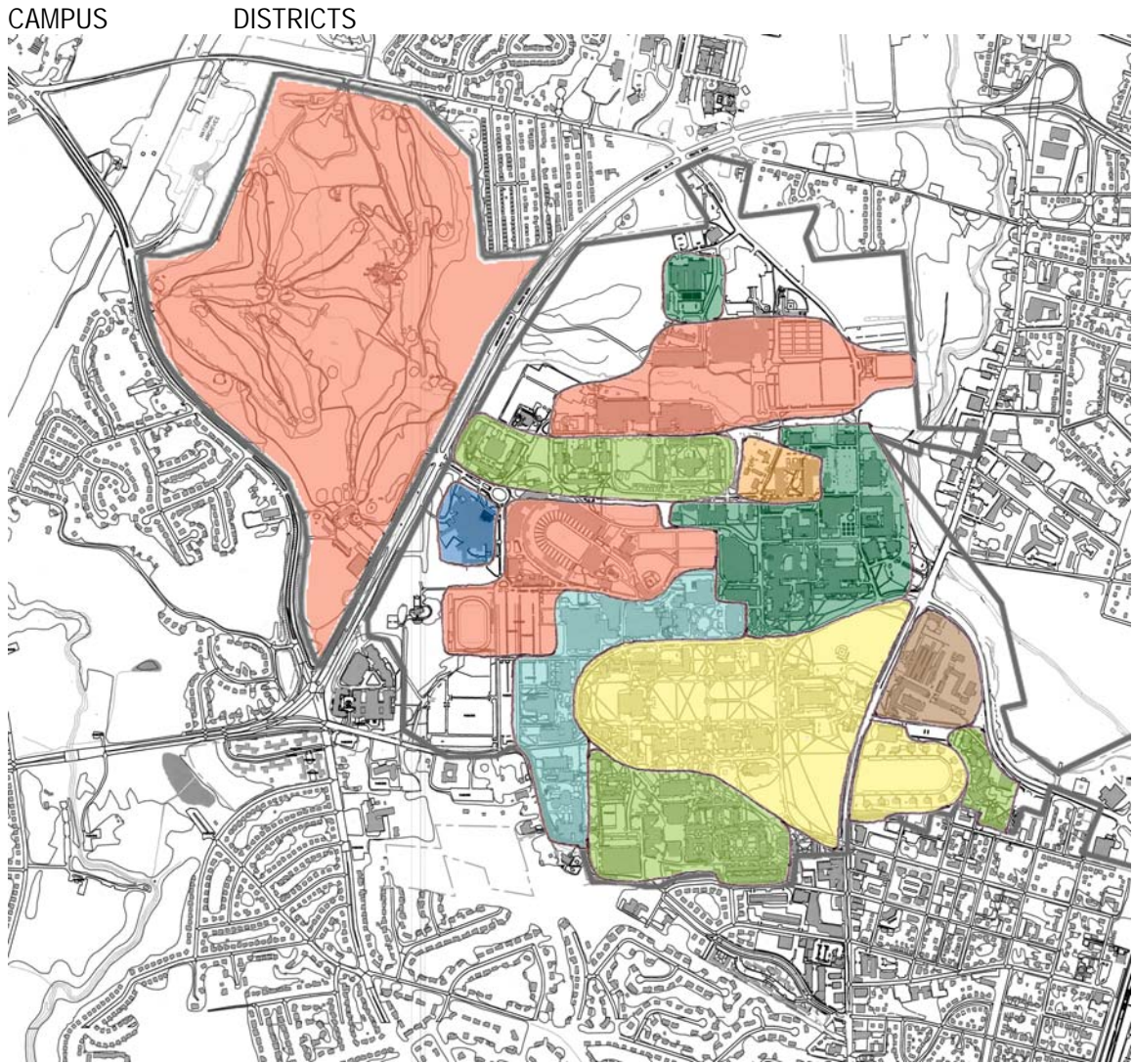


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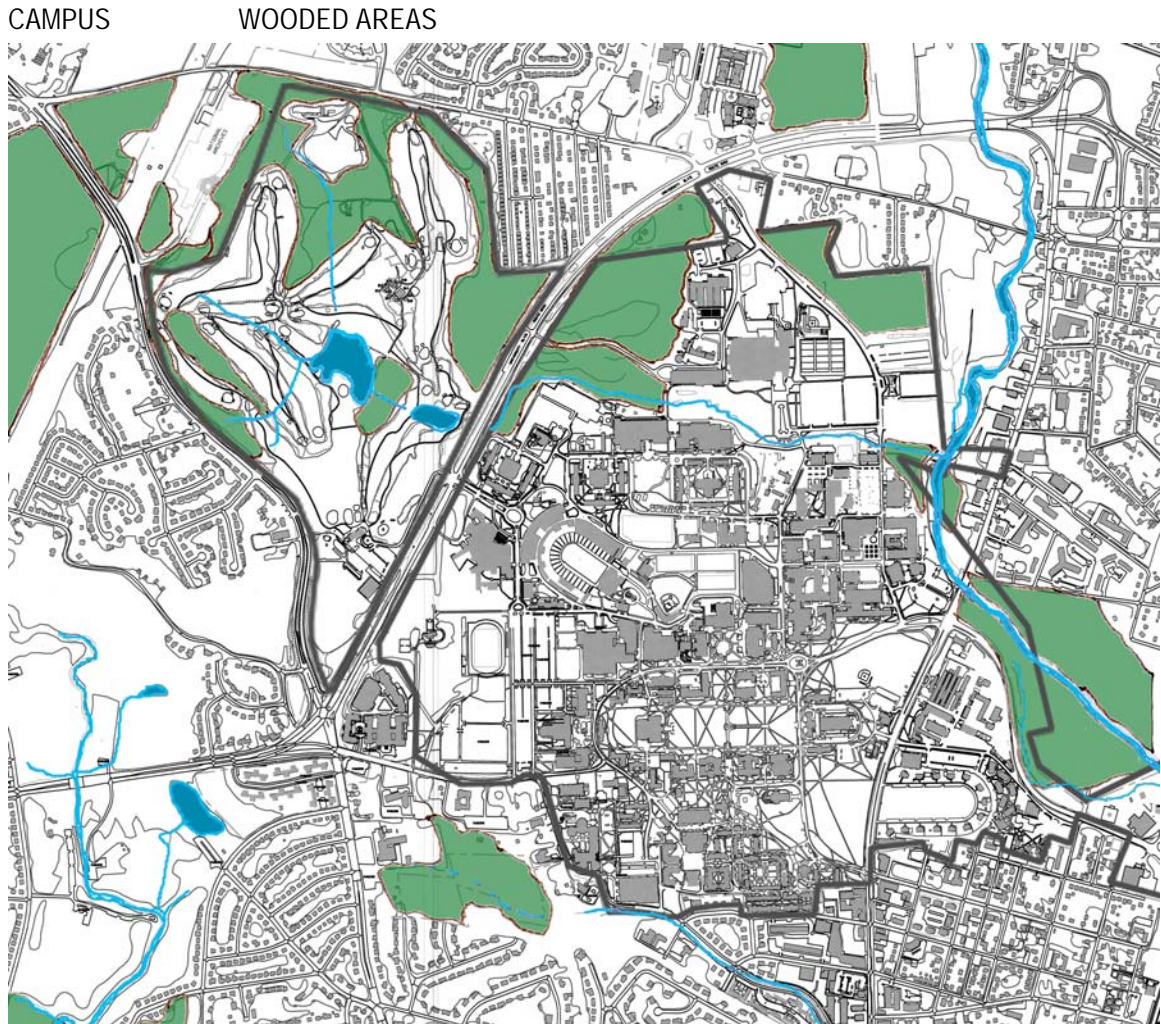


Figure 2.XX (Author)

The unshaded portion of this diagram represents the area to be masterplanned. Relatively little change is anticipated for the golf course, the large area on the left containing the two largest retention ponds. It is included in the thesis master plan by virtue of the fact that it contains the headwaters of Campus Creek. Before the topography was altered to accommodate golfers, a system of ridges mirrored in miniature the ridges of the original campus terrain.

CAMPUS

ROADS AND INTERSECTIONS

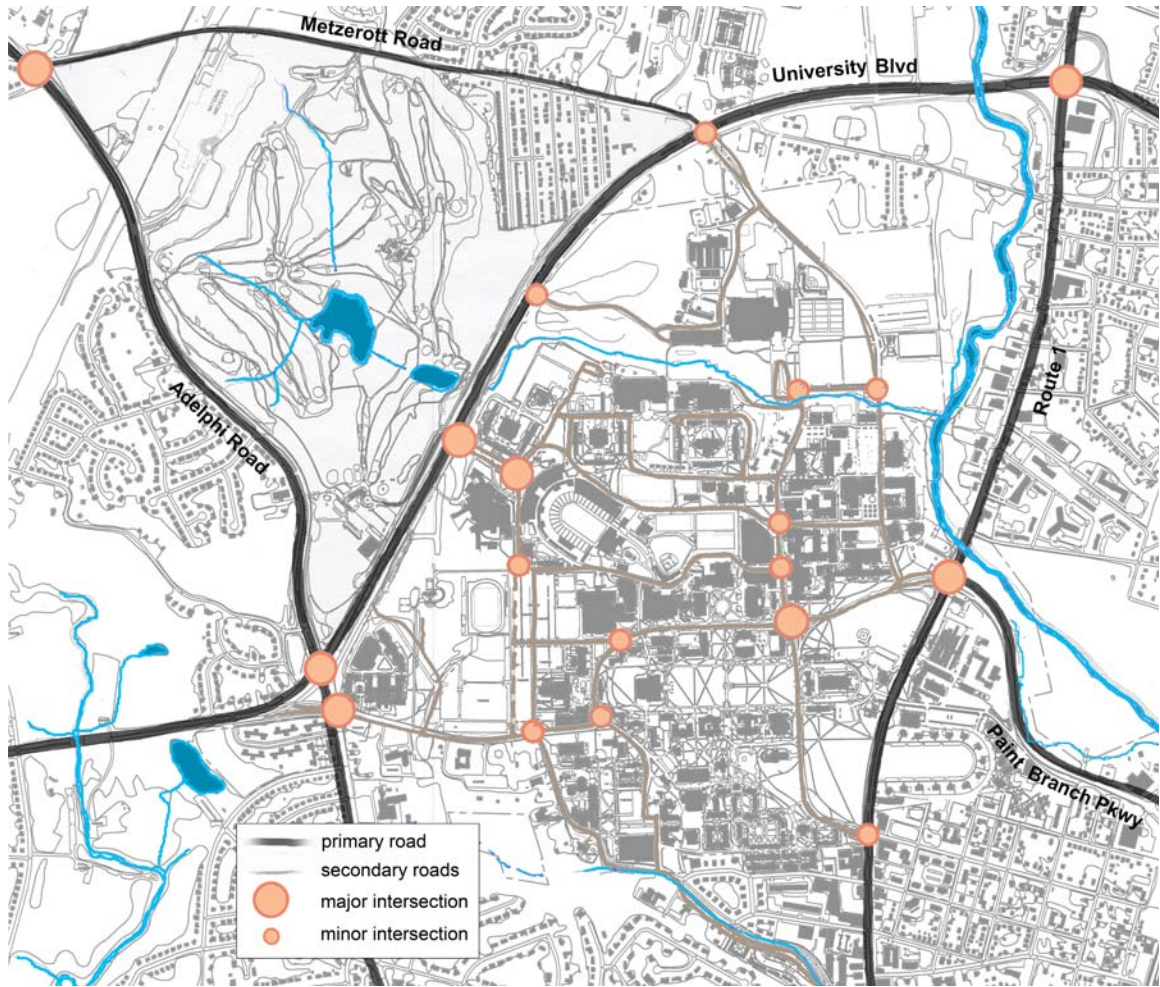


Figure 2.XX (Author)

CAMPUS

PARKING GARAGES

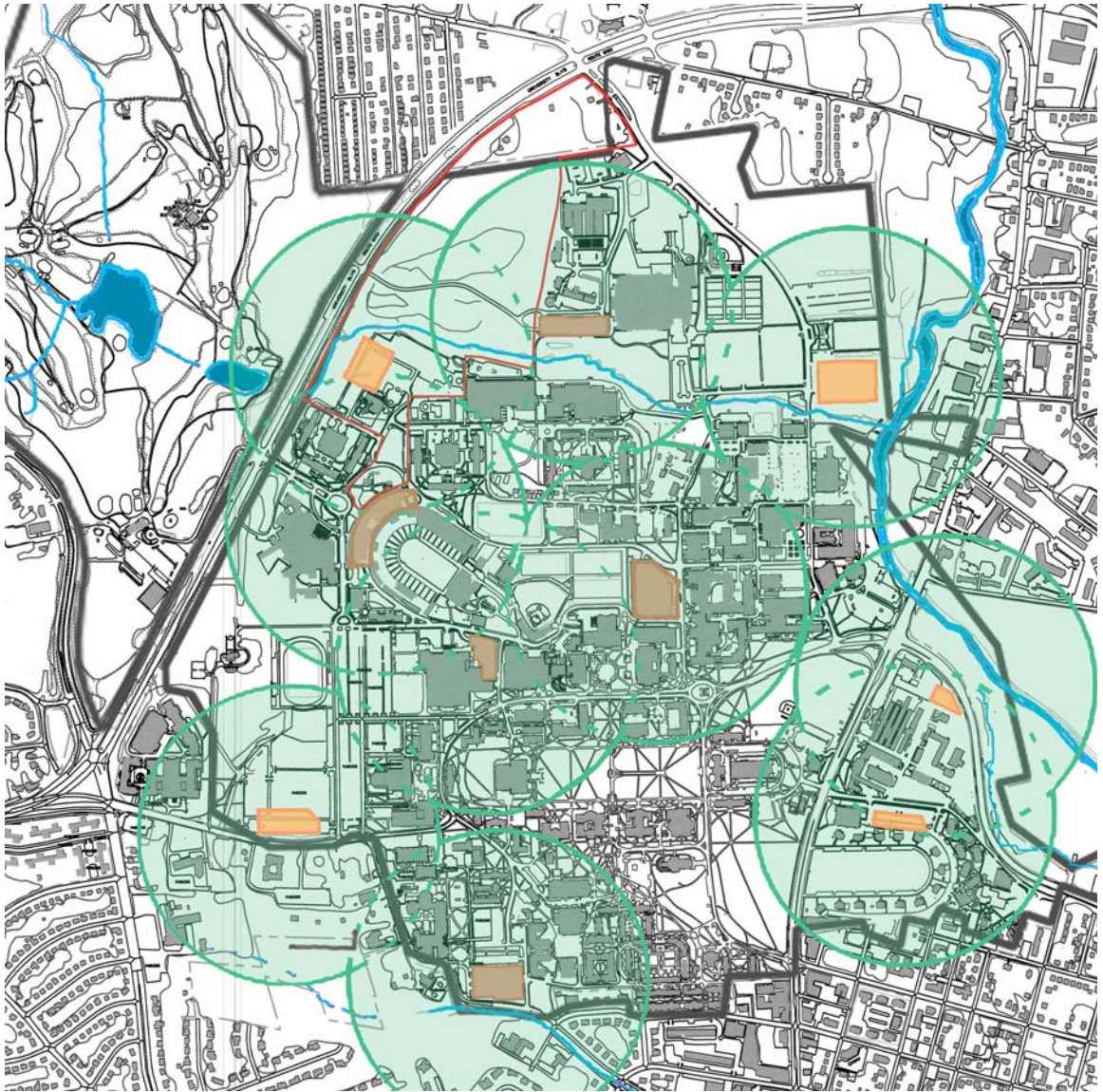


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CAMPUS FIELDS AND PLACES

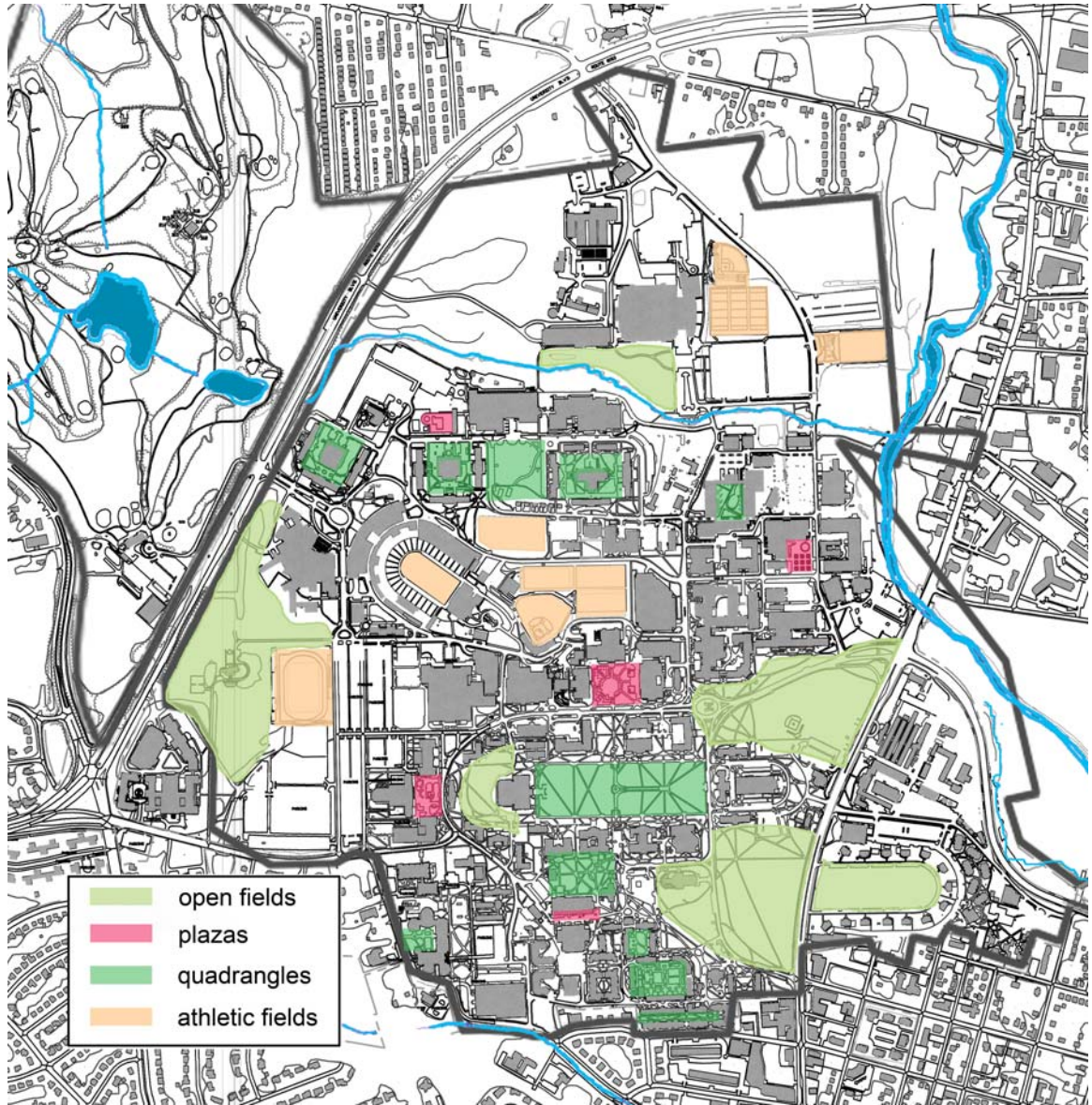


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CAMPUS

PEDESTRIAN PATHS

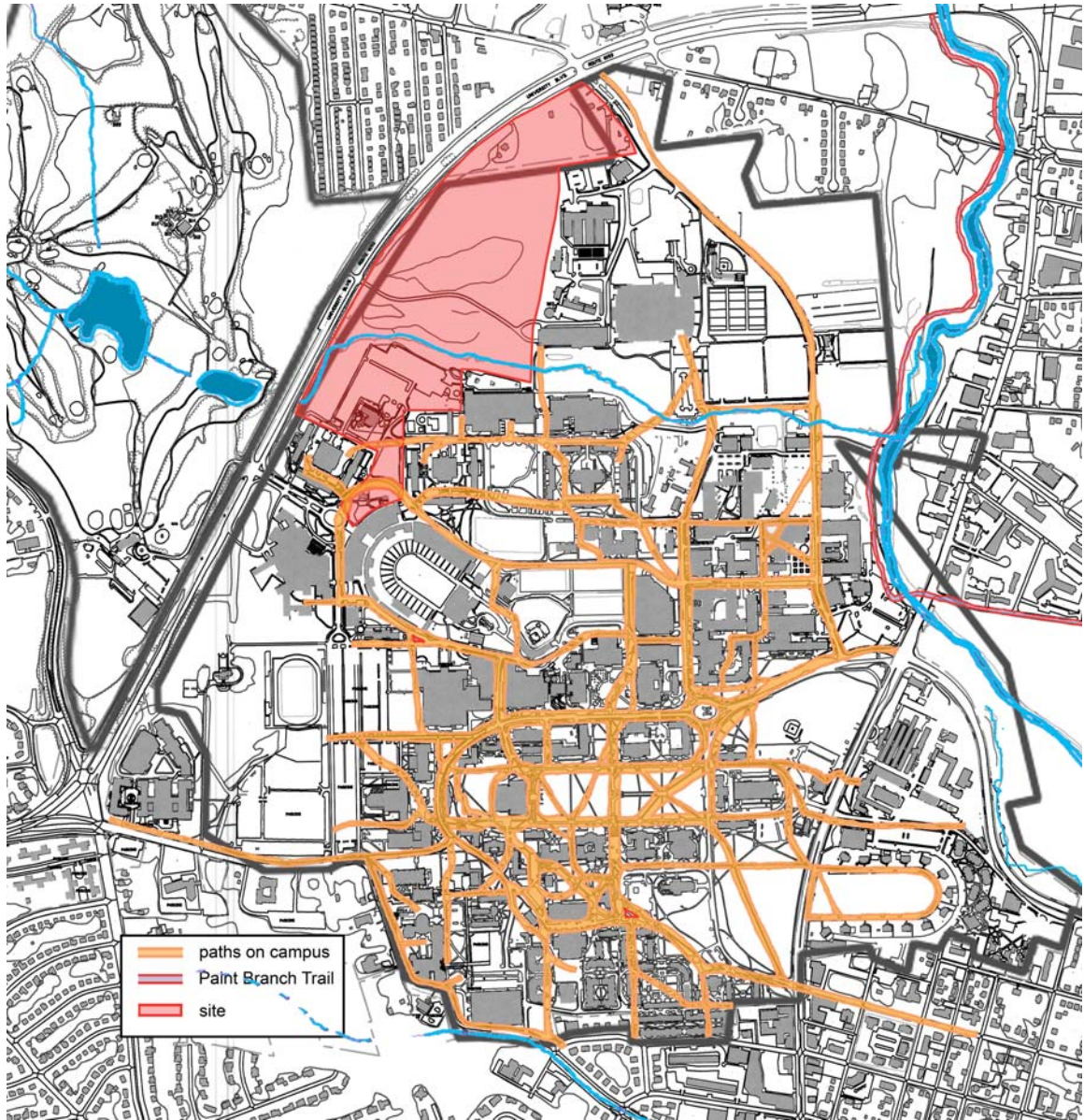


Figure 2.XX (Author)

WATERSHED

FLOODPLAIN AND WETLANDS

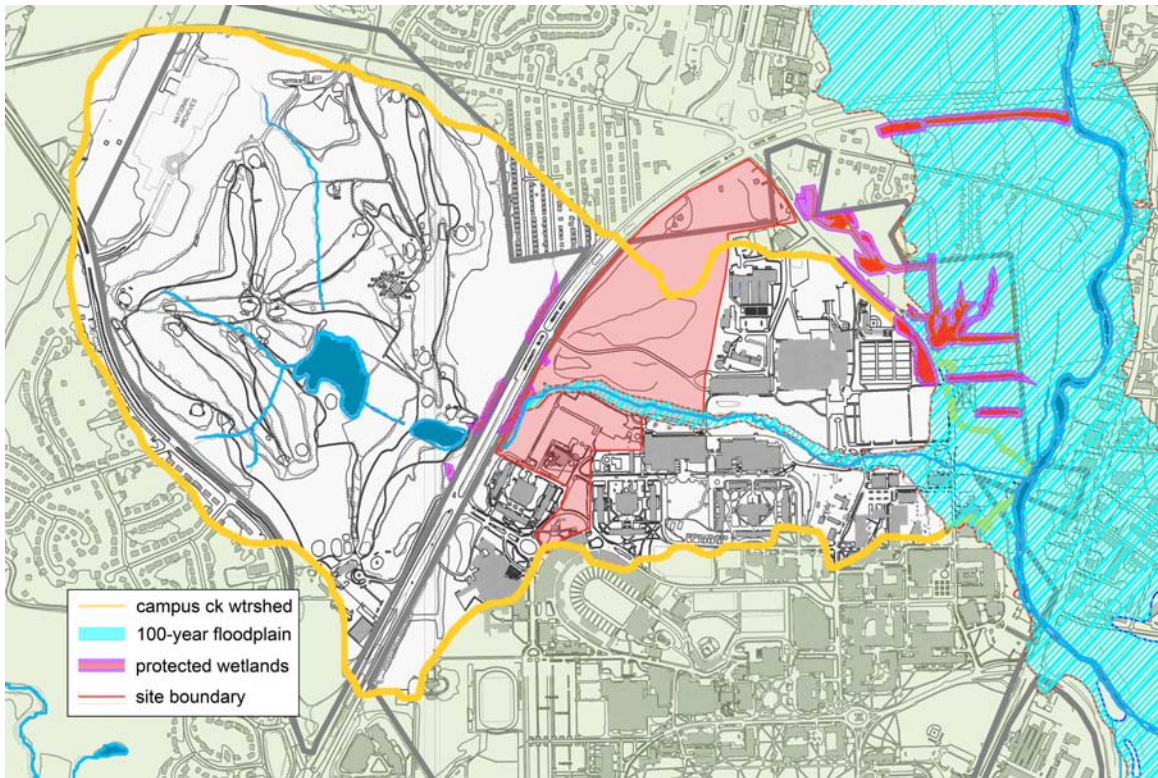


Figure 2.XX (Author)

As far as can be determined, there does not yet exist an official version of the watershed of Campus Creek. This diagram represents a best estimate based on the surrounding topography. Many sections of the watershed boundary are ordered by road cuts that direct runoff, University Blvd. being the outstanding example. Portions of Metzerott Rd., Adelphi and Paint Branch Trail also function in this way, seeming to direct water into the creek that might otherwise flow to an adjoining watershed.

WATERSHED

STORMWATER

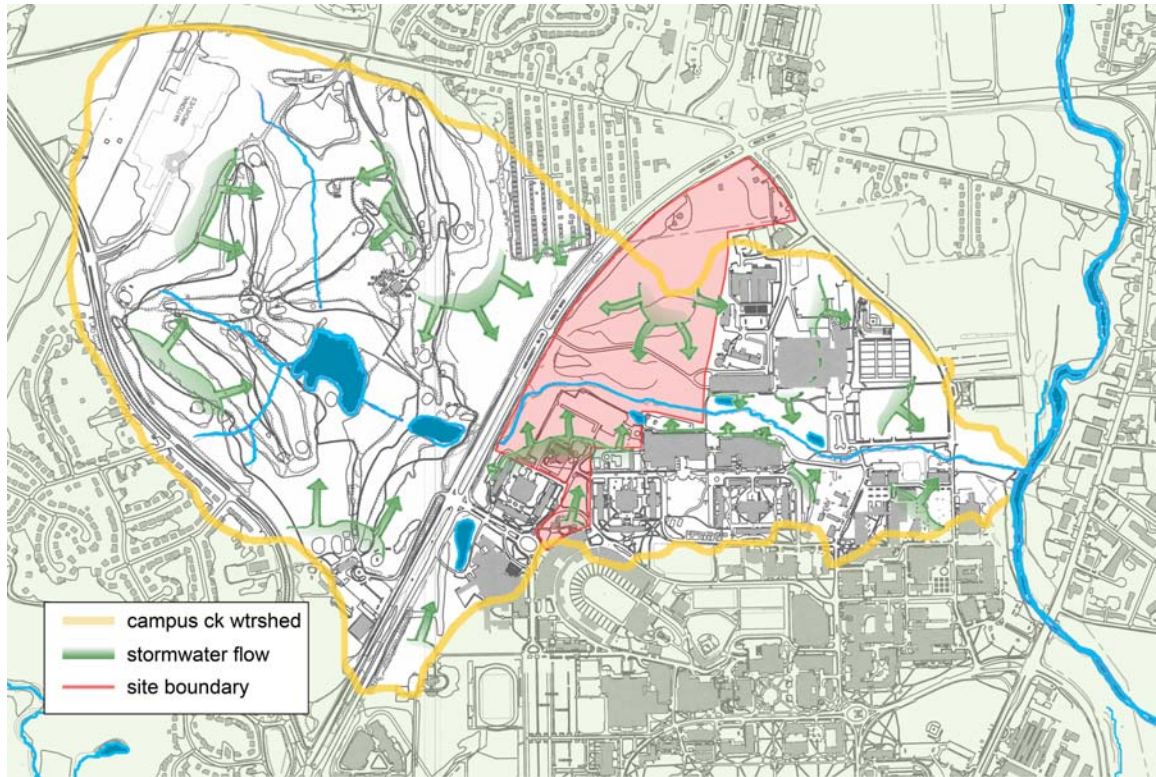


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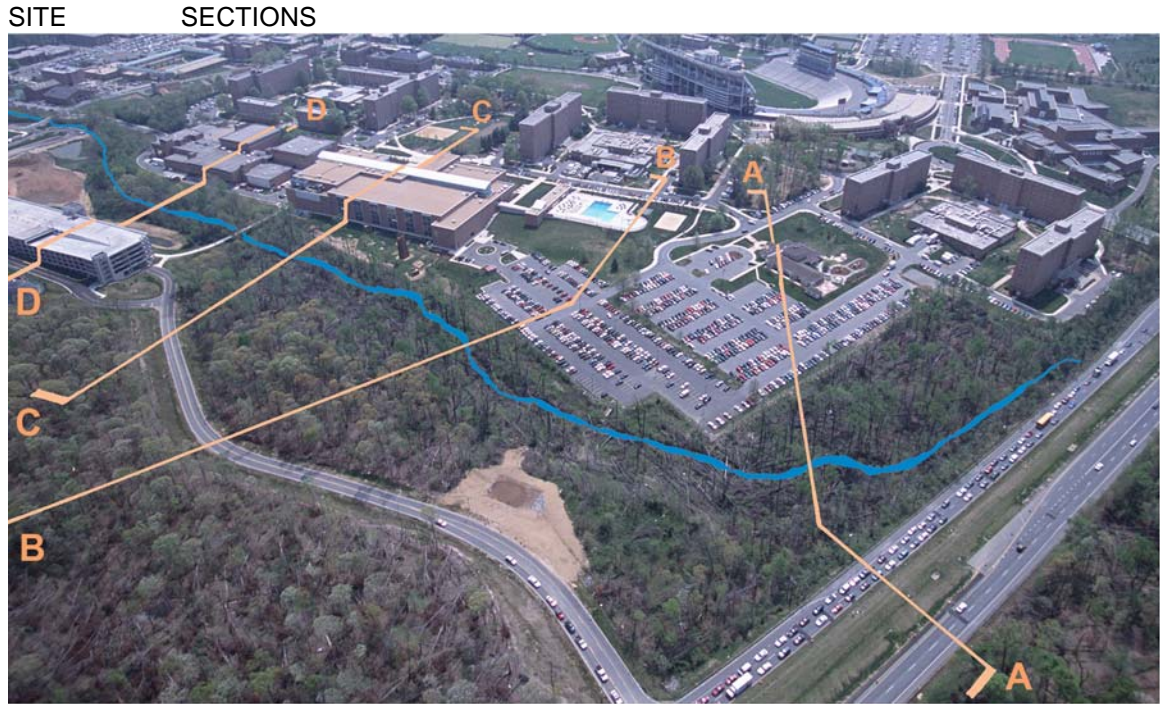
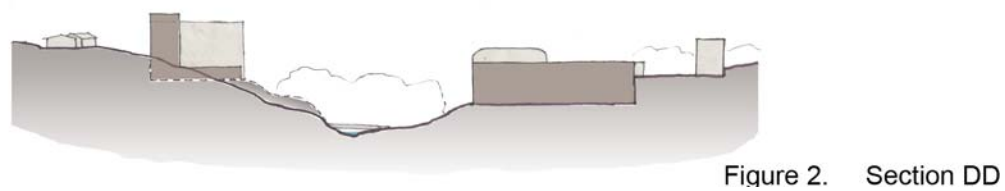
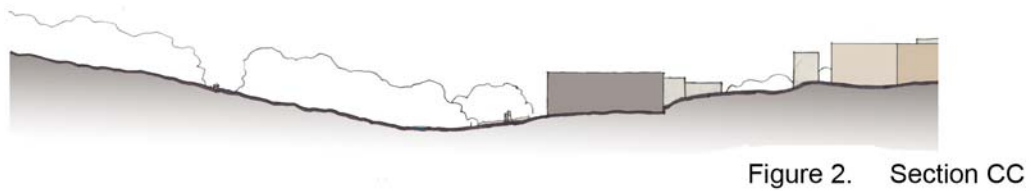
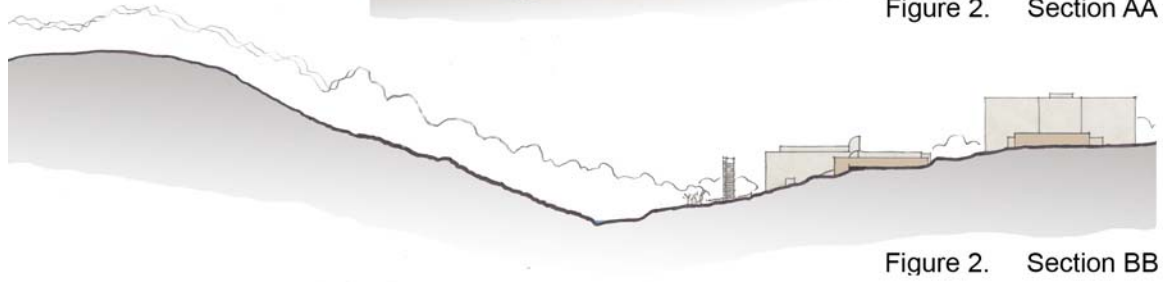
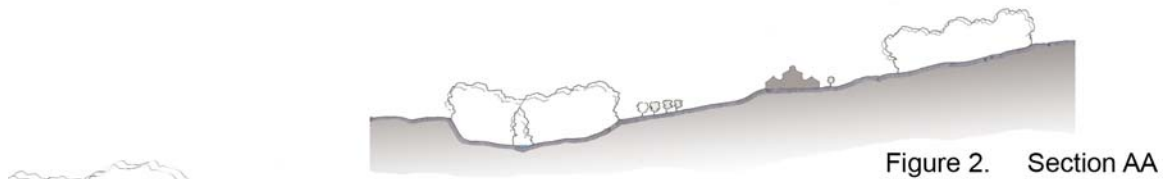


Figure 2. Aerial photograph looking south, showing section cut locations. (*Facilities Planning*)



SITE

TREE CANOPY

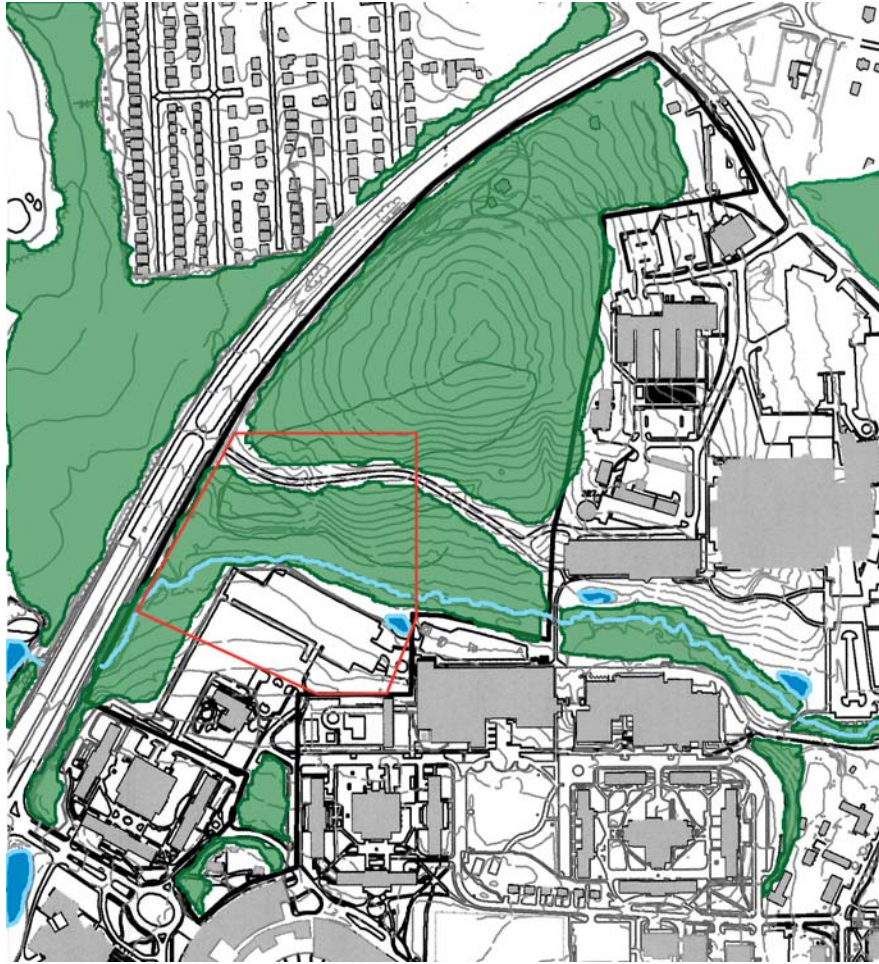


Figure 2.XX (Author)

SITE

FIGURE/ GROUND

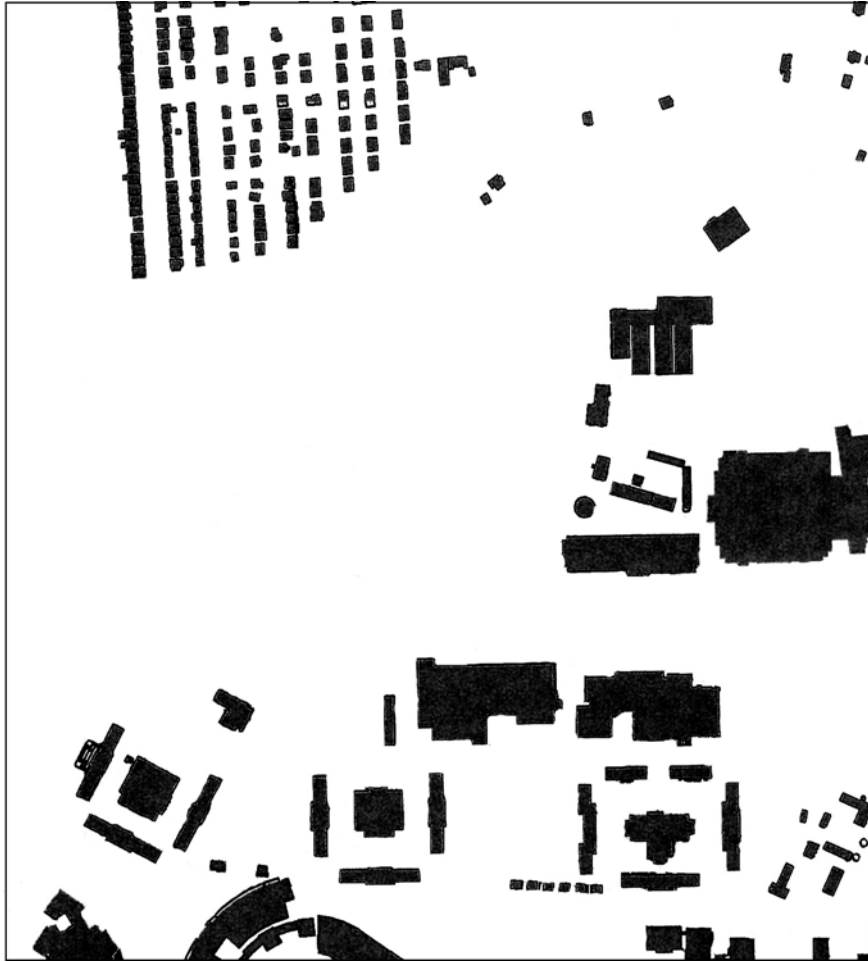


Figure 2.XX (Author)

SITE

SUN PATH

SITE

VIEWS

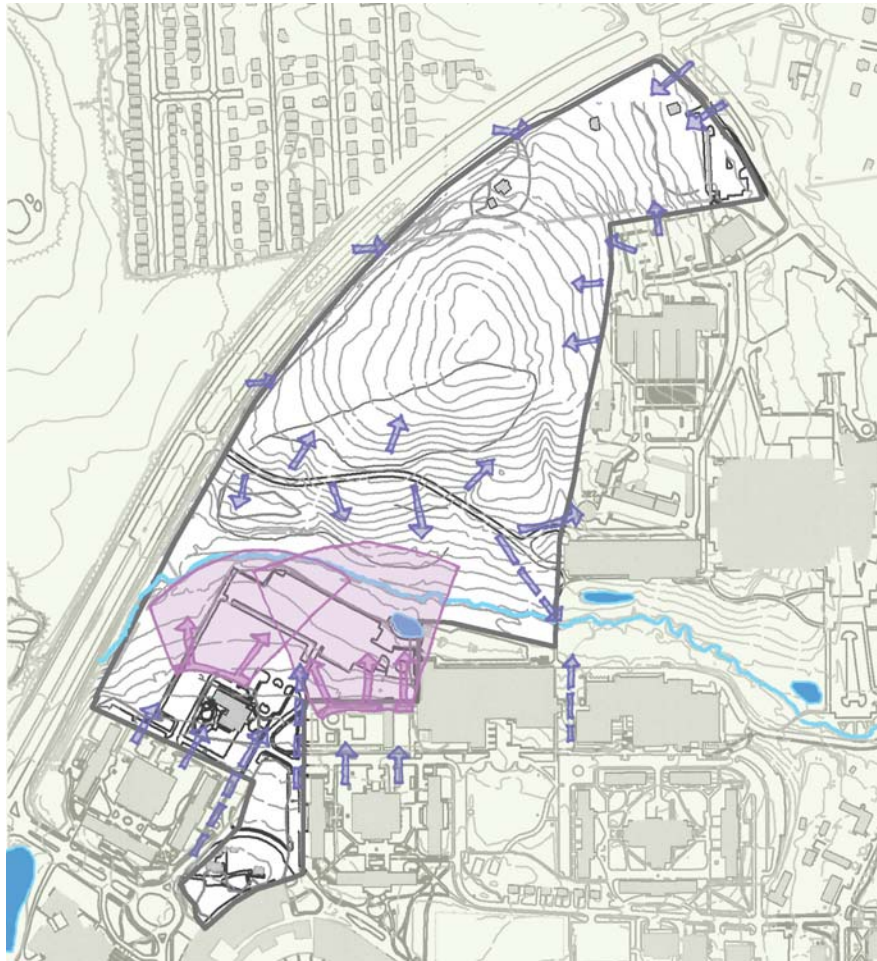


Figure 2.XX (Author)

Views are one of the primary ways that areas of the campus can be connected to one another, and they are in somewhat short supply on the site. From the northwest and the east, views and out of the site are inhibited by undergrowth and the rise in the topography. There are some very nice views north across the creek from the Campus Recreation Center and the Center for Young Children, and the suggestion of views looking south from Terrapin Trail.

SITE

BUILDING USES

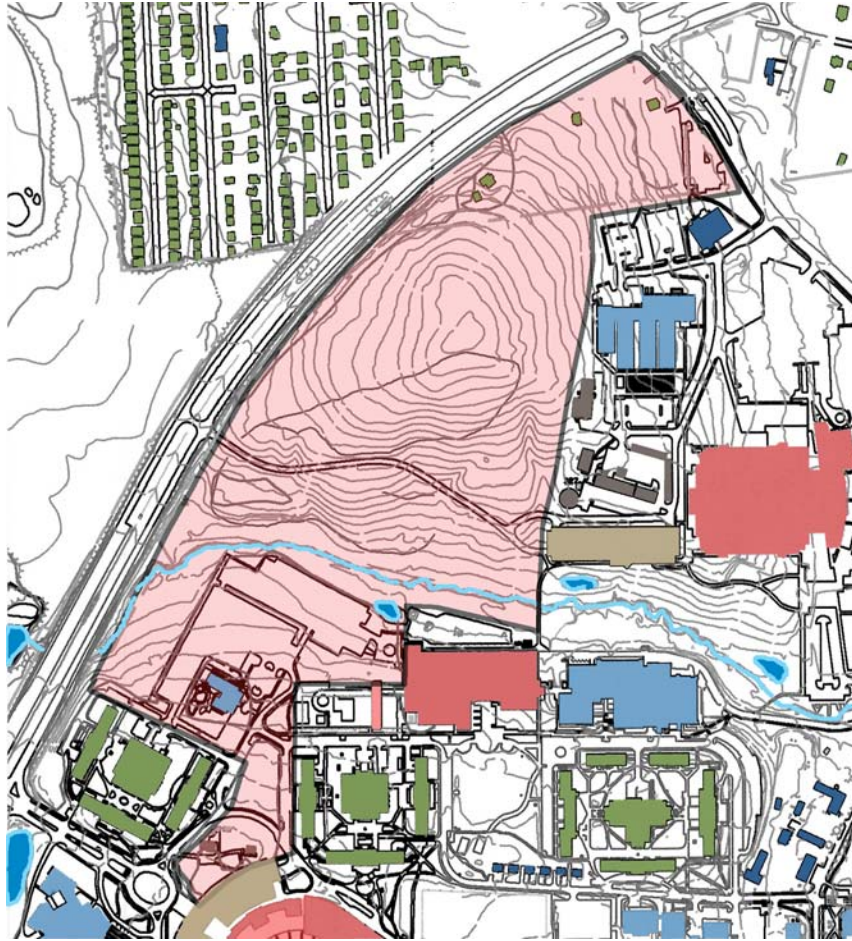


Figure 2.XX (Author)

SITE

IMPERVIOUS SURFACE

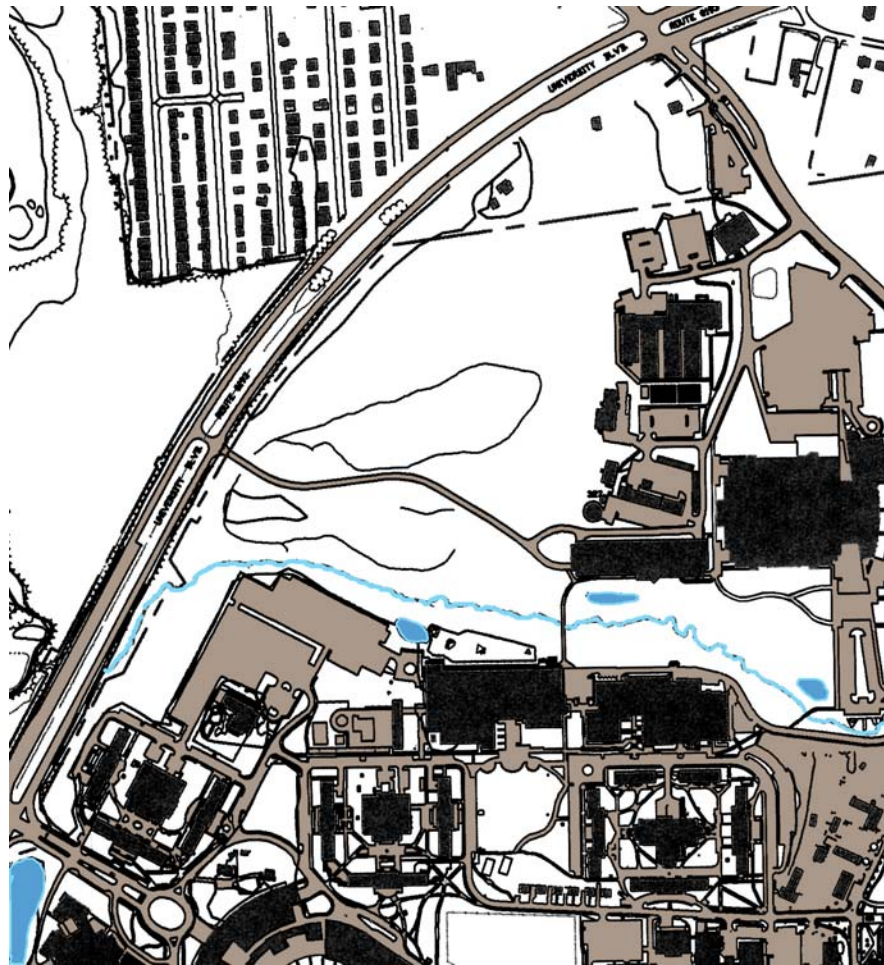


Figure 2.XX (Author)

Regulatory Issues

The University is in the privileged position of not having to answer to municipal or county regulating bodies regarding zoning, life safety, historic preservation or accessibility issues. It has what is described as a collegial relationship with the Maryland Department of the Environment, the Maryland Department of Natural Resources, and the Maryland Department of Historic Preservation, in which consultation is encouraged but not required by the state.

Zoning issues such as building envelope and setbacks are addressed by the Department of Facilities Planning through design guidelines.

THE 2000 FACILITIES MASTER PLAN

The planning process that affects the thesis site most closely is the Facilities Master Plan that the University of Maryland College Park is required by law to complete every 10 years. Formal planning efforts began in the early 1970s following the student population explosion of the 1960s. A plan completed by a campus planning firm in 1976 was rejected by the Office of State Planning, and a 1981 document produced by the University's planning office had little impact.⁷ Following the University's designation as flagship school of the University System of Maryland in 1988, the 10-year cycle with intermediate reviews was initiated.

The current master plan represents a significant shift from the 1991 version in a number of respects. Dominated by "the need to address the urgent requirements for space at a large, thriving, and complex university," the previous plan had not dealt significantly with preservation of the university's architectural heritage, architectural design values, public spaces or landscaping.⁸ Now much more aware of its image in the public eye, and the value of that image, the Master Plan puts forth four principles to guide future development

- 1) Plan the built and natural environment in a way that preserves the beauty of the campus and protects the environment;
- 2) reduce the number of automobiles on campus and eliminate vehicular congestion to the extent possible while promoting unimpeded movement across the campus;
- 3) reinforce the campus's role as a good neighbor in the larger community by the careful development of sites on the campus periphery or in outlying areas that link us to the community; and

⁷ Brenner, Greg, et al. The University of Maryland: Study of and Proposals for the College Park Campus. Class project for UM Urban Problems Seminar (ARCH 453 and URBS 488X) led by Professor David Fogle; 1999; foreword.

⁸ University of Maryland Facilities Master Plan, Section I, accessed at www.facilities.umd.edu on 15 May 2006.

- 4) preserve the architectural heritage of the campus and enhance it through open spaces, gathering places, vistas of green lawn and trees, and groupings of buildings that promote a sense of community.⁹

The Master Plan elaborates each of these basic goals into 11 planning principles; it goes on to examine each of the principles in detail, and reviews each of the eight campus Districts to highlight the principles that particularly apply to their future development.

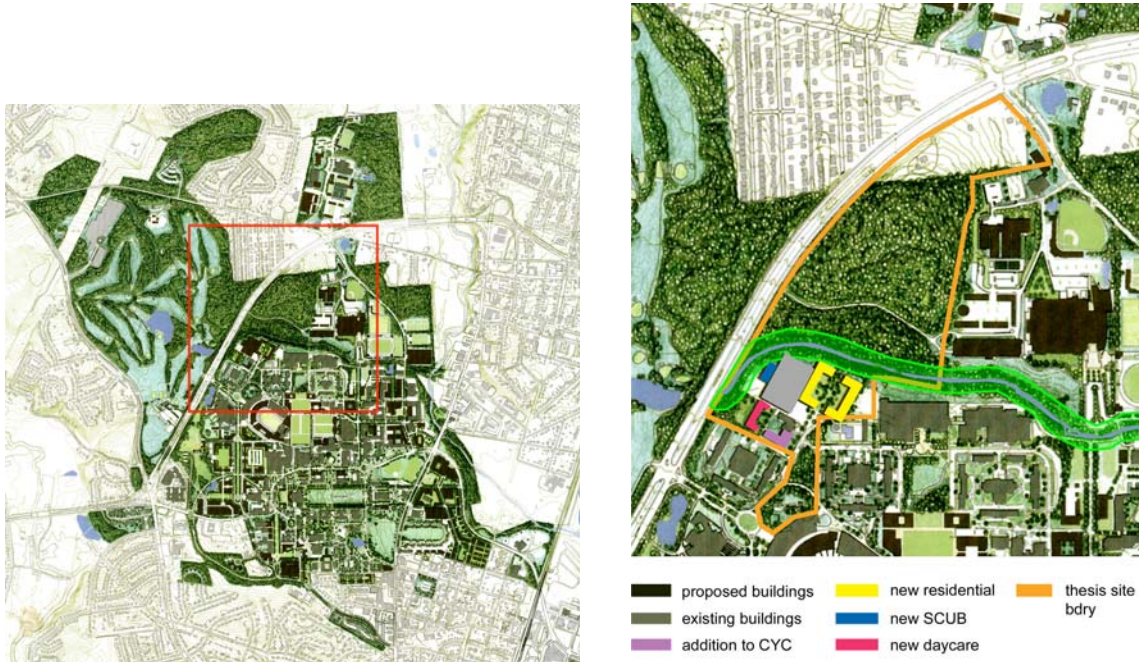


Figure 2.xx The area that has been enlarged in the neighboring diagram is shown within the red square. The additional pieces in this diagram are the University's outlying properties. (*Facilities Planning*)

Figure 2.xx The structures that the Master Plan proposes, that fall within the thesis site boundary are marked with colors according to their proposed uses.¹⁰ (*Author*)

Taken as a whole, the Master Plan's objectives could not be much more consonant with the goals of this thesis. It is exceedingly supportive of environmental restoration and maintenance, and of the restoration of Campus Creek in particular. It recognizes the interactive relationship between buildings and open space, and the role that planning and design play in creating a harmonious and well-functioning academic setting. On closer examination, a few ambiguities crop up. As in the 1991 Master Plan and the

⁹ Ibid.

¹⁰ Hayes, Daniel, *Facilities Planning*, personal conversation with author, 31 March 2006.

planning work back to 1973, no attempt has been made to envision anything specific for the Wooded Hill. That plans have been made for an area is no guarantee that something else will not happen, of course; but the blankness in this section of the campus map signals that the Master Plan has not yet come to grip with its challenges. And that lack of resolution places the health of the Campus Creek watershed at risk, because stream restoration needs to be supported by compatible uses and by a community that is committed to maintain and monitor it.

Figure 2.xx also illustrates the packing in of uses on the south side of Campus Creek, encroaching on the 100-foot buffer that is recommended on both sides. Facilities Planning has since looked at modification of the orthogonal geometry to create schemes that are more sympathetic to the site and the creek. The diagrams in



Figure 2.xx Studies of development north of the Denton and Ellicott residential communities made in 2002. (*Facilities Planning*)

Figure 2.xx illustrate the difficulty of simultaneously doing justice to the creek, the need for parking, and the orientation of the buildings relative to each other and the site.

Another source of ambiguity about the Creek's identity and presence is that campus district boundaries are laid over it all along its length from University Blvd. to Paint Branch Creek. These boundaries more typically follow roads; roads are used daily by

many people, and get repaired relatively promptly when they are damaged. The creek is an edge as a road is, but it is not also a path, at least not for humans, at this time. The point is that roads such as Paint Branch Drive and Campus Drive have an identity and a purpose in the imagination of the campus community that the creek does not. District boundaries need to go somewhere, and edges are a reasonable place to put them. Perhaps it is sufficient to acknowledge here that in planning and design edges need focused attention because by their nature they abut other entities. In the case of Campus Creek, an overlay district might be appropriate in order to highlight its identity as a dynamic system that is living and changing, and has virtues and requirements within the landscape of built and natural elements that differentiate it from other types of boundary conditions.

In summary, there is a great sense of purpose and good will about the welfare of Campus Creek, but not a great deal of concrete information in the current Facilities Master Plan to guide comprehensive planning for the creek and the wooded areas to its north.

CHAPTER 3

DESIGN AT THE SCALE OF THE LANDSCAPE

STREAM RESTORATION

REVISITING ROLES FOR ARCHITECTURE

PROGRAM AT THE LANDSCAPE SCALE

SITE FRAMEWORK SCHEME

LANDSCAPE PRECEDENTS

DESIGN GOALS

The image in Figure 2.XX on page 35 is a significant one, in part because it looks at the University campus from a *mental* point of view that is almost as inaccessible as the physical birdseye viewpoint. Access this area of campus is entirely from the south, so that visitors are oriented northward; we are coming to and from the utilitarian task of car parking, and have little to no incentive to wonder what the view is like from the other direction. With the vantage point that this photograph gives us, we have the opportunity to look at this area *as a landscape*, and to consider what approaches would initiate new and healthier patterns.

STREAM RESTORATION

A clear starting point in the search for a healthier future for the creek at the scale of the landscape is to review stream restoration practices, and evaluate them for their suitability as architectural mediators of meaning in the landscape as well as environmentally restorative interventions.

Restoration of urban streams appears to be rapidly becoming a specialty in itself, as communities and municipalities take on the responsibility of working for the improvement of their local environment. There is some range in the determination of what constitutes an urban stream, but this designation is generally given when the impervious cover of the watershed area is between 10 and 15 percent.¹¹ The term implies that the stream

¹¹ As a rough measure of the impervious cover on campus, the coefficient figure for institutions supplied by the Center for Watershed Protection was used; at .34 of buildable area, this probably puts Campus Creek well within the designated range even without more precise measurements. Center for Watershed Protection. A User's Guide to Watershed Planning in Maryland, December 2005. Prepared for the Maryland Department of Natural Resources, Watershed Services; p. 64. Accessed at <http://www.cwp.org> on 16 July 2006.

has been subjected to adverse effects of development in the watershed. One category of effects is structural: larger and more frequent influxes of water from the increase in impervious surface area cause downstream channels to enlarge by widening, downcutting, or a combination of both. Channel enlargement severely degrades the quality of instream habitat structure and sharply increases the annual sediment yield from the watershed.¹²

Another group of effects is biochemical. Untreated runoff entering the stream can contain household and industrial chemicals, oil and other pollutants from paved surfaces, and sediment from disturbed soil at construction sites.¹³ Excess fertilizer from residential yards and golf courses causes commonly seen algal blooms, which take oxygen from the water as they decay and asphyxiate other aquatic life.

Protecting streams from biochemical contaminants requires enlarging the scope of investigation from the stream to the limits of the watershed unit being addressed. The areas from which the runoff is being aggregated, and the directions from which it is approaching the stream must be taken into account. Following is a list of project types that are undertaken in this expanded scenario.

Stormwater retrofits: stormwater management measures installed in an urban or ultra-urban landscape where little or no prior stormwater controls existed.

Reforestation: pervious area management projects increase tree cover on open lands in upland areas and along the stream corridor, and enhance the quality of remaining forest and wetland.

Discharge prevention: these projects stop the entry of sewage and other pollutants into the stream.

¹² Brown, Ted and Deb Caraco. "Channel Protection." *Water Resources IMPACT*, Vol. 3, No. 6, November 2001; p. 16.

¹³ Citation?

Pollution source control: projects reduce or prevent pollution from residential neighborhoods or stormwater pollutant “hotspots”.

Municipal operations: projects reduce or prevent pollutants from entering the watershed by modifying municipal infrastructure maintenance policies.

With the exception of stormwater retrofits and reforestation, most of these project types would be most appropriately handled by the environmental arm of a local or regional government through policy and enforcement rather than at the level of environmental design.

The remediation methods that focus most directly on the stream itself emphasize structural stream repair. Categories of particular techniques (termed practice types in the profession) are:

Bank protection: protects bank from further erosion and collapse;

Grade control: maintains desired streambed elevation;

Flow deflection/concentration: changes the direction of stream flow or concentrates it;

and

Bank stabilization: uses regrading and plant material to secure stream banks.¹⁴

Many of these practices have been used for 10 years or less, so their longer-term effectiveness is still under study. And because streams are dynamic landforms that undergo ongoing changes, the success of a given practice installation depends in part on its ability to adapt to changing conditions, and on the rate of change occurring in the stream.

¹⁴ Brown, Kenneth B. Urban Stream Restoration Practices: An Initial Assessment. Elliot City, Maryland: The Center for Watershed Protection, 2000; p. 4. Summary of findings available in .pdf format at www.cwp.org.

Sensitive areas conservation: land conservation projects provide permanent protection from development to sensitive areas, including contiguous forest, wetlands, and rare, threatened and endangered species.

Agricultural best management practices (BMPS): refer to a series of techniques that farmers and ranchers can implement to reduce erosion, pollution, water use, and runoff from their land.¹⁵

These techniques are often included in watershed plans, which are the culmination of extensive studies of watershed boundaries, mapping data, government regulations, stakeholder involvement, and environmental assessment. At the watershed level there are often a number of sites akin to Campus Creek where the severity of the environmental damage must be assessed, and projects prioritized according to the resources available. Watershed planning is usually undertaken by municipal authorities or citizen groups who have the ability to carry out a course of action over a number of years. The challenge of managing this process is stated succinctly in Chapter 1 of Site Planning for Urban Stream Protection:

Urban stream degradation is a classic example of the difficulty in addressing long-term environmental change at the local level. Development is a gradual process that spans decades and occurs over a wide region of the landscape. It is, however, composed of hundreds of individual development projects completed over a much shorter time-span, which transform just a few acres at a time. Consequently, the true scope of stream degradation may not be fully manifested at the watershed scale for many years. The challenge for local planners is that they must review and mitigate the impact of each individual development proposal over the long term within a watershed context.¹⁶

The challenge facing the University is qualitatively quite similar, and it is more than likely that Campus Creek and the remaining small waterways on campus (Guilford Run, Terrapin Creek, College Park Woods Creek) arrived at their current condition through a very similar process.

¹⁵ A User's Guide, p. 7.

¹⁶ Center for Watershed Protection. Site Planning for Urban Stream Protection. p. 10. Accessed at <http://www.cwp.org> on 16 July 2006.

The emphasis on stakeholder involvement from the very beginning of the watershed planning process emphasized in A User's Guide to Watershed Planning in Maryland holds equally as true for the University. Sustainable restoration of Campus Creek will involve not only tangible interventions such as curbing bank and streambed erosion, finding alternative means of dealing with stormwater, and creating stream current flow closer to that which might have existed originally. It will involve sustainable organizational structures, agreements, and human relationships. Jose-Luis Izursa, in his paper on the restoration of the creek points out that

restoration must also include compromise from University of Maryland officials, student community involvement, and even long-term stewardship. Without this community support, the site may not be protected and restoration efforts may be in vain.¹⁷

¹⁷ Izursa, Jose-Luis. Restoration of the Campus Creek at the University of Maryland, College Park. Paper for Seminar in Principles of Aquatic Restoration Ecology (MEES 608X), <http://www.agnr.umd.edu/UMCPEcology/PA2002WA001.pdf>, accessed 28 March 2006.

PROGRAM AT THE LANDSCAPE SCALE

The east-west orientation of movement along the creek is one of the possibilities for human occupation of the thesis site. As a way of starting to think about fitting possibilities for program to the site, the diagram below describes other ways of traversing it.

The second diagram shows that there are relatively few areas that are over 20% slope; they are far outweighed by the proportion of the site that is between 10 and 20%. So there is not a tremendous constraint on where people can move, or structures sited.

For planning purposes, recreational activities are commonly divided into categories labeled “passive” and “active”. The distinction turns not so much on what the activities are, but what kinds of settings they require.

Active recreation typically involves facilities such as athletic fields or courts, concessions, community gardens, children’s play areas, dog yards, or bicycle paths.

Passive recreation utilizes non-landscaped green space in parks, undeveloped land or minimally improved land, and includes landscaped areas, ornamental gardens, picnic areas, bodies of water, and trails without recreational staffing. Activities such as horseback riding and fishing can also be included.¹⁸

Passive activities clearly pose less potential for destruction to ecosystems because they involve less disturbance of the ground, fewer impervious surfaces, and less intensive use. The thesis site can be diagrammed in terms of the appropriateness of active or passive activities .

This perspective suggests that there are areas of more intensive use at the north and south ends of the site, with the passive uses concentrated in the middle over the Wooded Hillock zone.

¹⁸ http://www.parks.sfgov.org/wcm_recpark/DAP/AppendixC.pdf, accessed on 9 January 2007.

What uses would emerge, and how would they be grouped, if some of the questions posed in the Design Goals section are restated as goals?

The creation of ecological and social connections across site edges, within the campus and with neighboring communities.

Raise University Blvd. where Campus Creek runs under it so that people and wildlife can pass through with ease.

Create a walking and biking trail along the length of the creek that will connect Paint Branch Trail with a trail around the wooded edges of the golf course.

Locate a new bridge across the creek. Can it serve more than just people?

The rehabilitation and protection of ecologically sensitive areas.

Design the streamside trail so that it is permeable to rainwater, and so that users are encouraged to stay on it rather than travel through the riparian buffer.

Development of Campus Creek as an amenity and as a legitimate focus of recreational activity.

See proposals under the first goal.

The utilization of distinctive site features to further develop the character of the North District. (See Appendix for diagram of districts.)

Locate overlooks on the Wooded Hill that provide views of other sections of campus.

Develop the potential of the vistas available from the slope south of the creek.

The creation of building and open-space ensembles that are respectful of the University's history and traditions, and appropriate for their location on campus and place in time.

The facilitation of education about and enjoyment of the environment at the site.

Investigation of a trail within the spatial volume of the streambed that allows visitors to be in closer contact with the biotic communities of the stream and to examine the stream restoration practices. This type of installation would also facilitate evaluation of the performance of the practices by university students.

Open areas at the streamside that allow visitors more direct views, and possibly facilitate projects by groups of visiting schoolchildren.

Inhabitable installations at strategic spots (such as a place visible from University Blvd.) that frame the landscape, offer gathering places for student investigators, and serve as witnesses of the investigational activity.

ROLES FOR ARCHITECTURE

One way of working toward these goals is to explore roles that architecture might take on within the landscape of the Campus Creek watershed. Some possibilities include the following:

A signaling or announcing role, alerting people to the presence of something worth paying attention to;

A framing role, setting off specific features of the landscape or indicating experiences to be explored.

An access role, providing understandable ways for people to enter an dpass through the woods and to cross the creek. Ways that the architecture might organize the experience of passing through would also fall in this category.

The role of promoting sustainability: in regard to its own energy use and materials, to the natural systems of the site, and to the organization of human behavior vis a vis the site

An identifying role, helping to create a distinct district, or forming a part of the University's public face on University Blvd.

A locating role. This is related to the role of identification, but instead of being perceived objectively, it might embody the experience of the Campus Creek site from the inside out, perhaps conveying new possibilities for inhabiting landscapes in present circumstances.

An educating role; in addition to the learning gained through the operation of the other roles, there could be a specifically didactic component.

A memorializing role, acknowledging in some way that events of human significance have taken place on the site in the past.

It almost goes without saying that many of these roles are not mutually exclusive.

And, depending on how particular roles are expressed or given prominence, other roles may become less significant. One way of working toward a hierarchy of the roles of architecture in the thesis site is to approach them from another vantage point. In the following pages a range of program elements are listed that seem to coincide with the three initial goals, and their potential for 'good fit' with various roles is evaluated. By balancing, and finding areas of compatibility between, the metaphoric and pragmatic

functions of architecture, it is hoped that the ecologies of humans and nature can be brought into a considerably more sympathetic and mutually supportive relationship than exists on the site presently.

SITE FRAMEWORK SCHEME

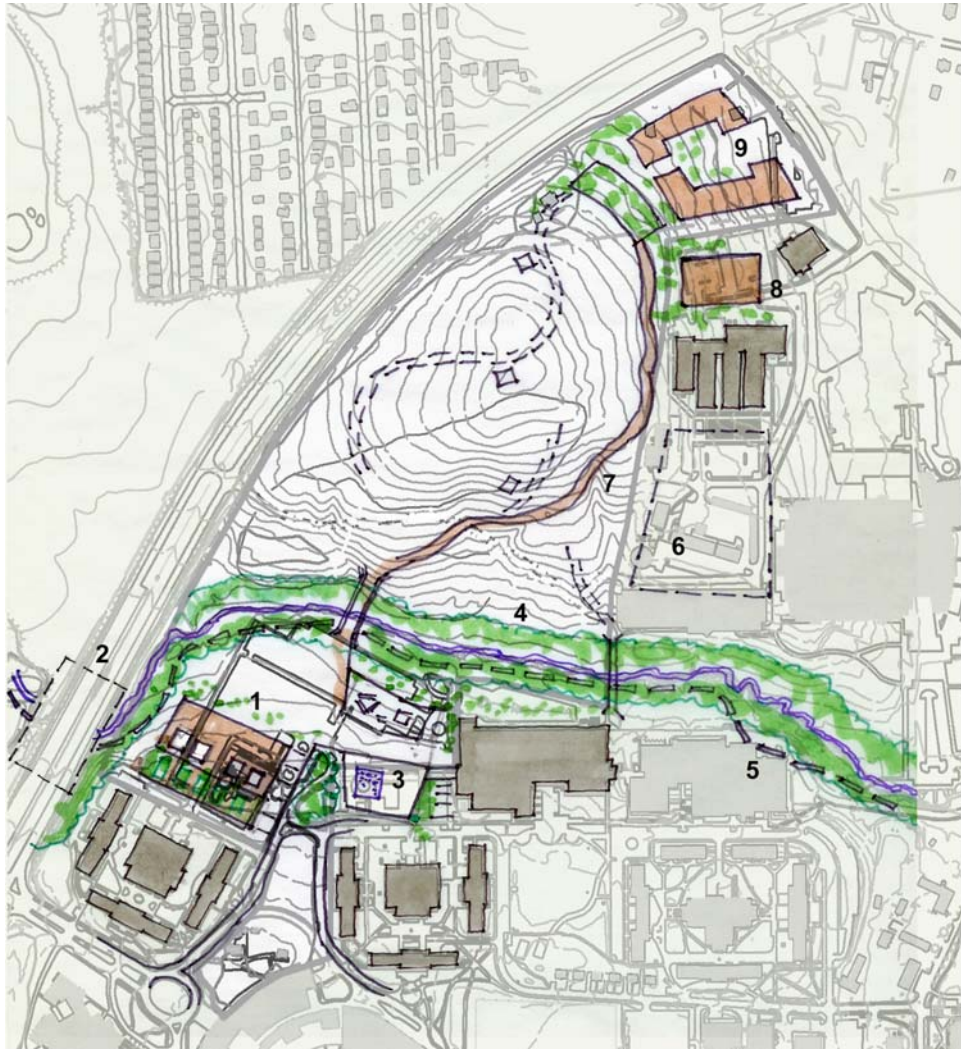


Figure 2.XX (Author)

- 1 New garage partially below grade replaces surface parking.
- 2 400' section of University Blvd. is elevated to the level of the adjoining roadway to allow free passage of water, wildlife and pedestrians.
- 3 Swimming enclosure is reoriented to allow green corridors leading to creek. (CYC is relocated to a location with more convenient public access.)
- 4 Area for placement of new bridge across creek.
- 5 100' riparian buffer on either side of creek.
- 6 Pedestrian/bicycle path along creek.
- 7 Occupiable landscape structures, linked to secondary paths.
- 8 North/south pedestrian/bicycle path
- 9 New garage serving Chesapeake Building and graduate student housing
- 10 New graduate student housing, with garden area as transition to woods.

The framework site scheme proposes an organization of program and people, taking the site as a whole into account. It is not a comprehensive master plan, for it

does not include many of the considerations necessary to make the plan truly comprehensive. But it takes into account a number of the goals for the landscape design cited earlier in this chapter.

LANDSCAPE PRECEDENT: FURSTENWALD CEMETERY
 Chur, Switzerland 1997 Dieter Kienast



Figure 3.xx A view from the pasture land to the west up to the wall marking the presence and higher elevation of the cemetery. (M. Dean)

Figure 3.xx Site plan. (M. Dean)

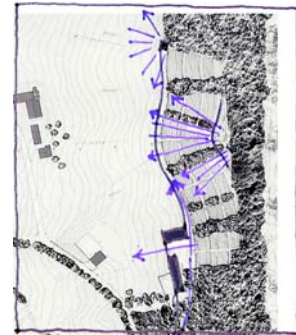
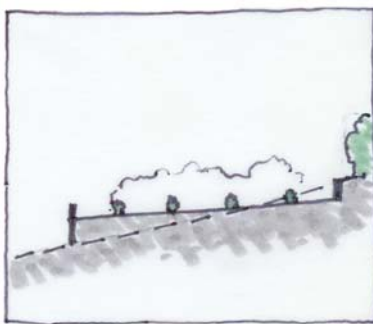


Figure 3.xx The slope of the land has been modified to create access for handicapped persons. It also enabled the installation of a retaining wall that forms an edge perceivable from within and without. (Author)

Figure 3.xx The realms that are defined by the bulwark and the enclosing walls of trees: 1) the cultivated domain of the living; 2) the observant outpost of mourners; 3) the sheltered place of the dead; and 4) the realm of nature, the forest of shadows and mystery. (Author)

Figure 3.xx The views from various vantage points on the site. (Author)



Figure 3.xx The view to the west between the 'laying-out hall' and the chapel, at a perpendicular to the axis of entry. (M. Dean)



Figure 3.xx The view through the overlook platform at the north end of the cemetery. (M. Dean)

LANDSCAPE PRECEDENT: PERRY LAKES PAVILION
Perry Lakes Park, Perry County, Alabama 2002 Rural Studio



Figure 3.xx (*Oppenheimer Dean*) The pavilion is used for catfish fries and family reunions, and serves as an outdoor classroom for a nearby college.¹⁹ The sparseness and simplicity of the design forms a beautiful counterpoint to the natural setting.



Figure 3.xx (*Oppenheimer Dean*) The Auburn students constructing the pavilion as their senior thesis project hung strips of canvas from trees to envision the roof.
Figure 2.xx (*Oppenheimer Dean*) A view of the pavilion showing the ramp enabling wheelchair users to reach the platform.

¹⁹ Oppenheimer Dean, Andrea and Timothy Hursley. Proceed and Be Bold: Rural Studio After Samuel Mockbee. New York: Princeton Architectural Press, 2005; p. 69.

LANDSCAPE PRECEDENT: PERRY LAKES FACILITIES

Perry Lakes Park, Perry County, Alabama 2003 Rural Studio



Figure 3.xx A boardwalk over swampy ground connects three restrooms with the pavilion described above. Each restroom has a unique design. All three are handicapped-accessible, and utilize septic mound construction to avoid digging in a flood-prone area. (*Oppenheimer Dean*)

Figure 3.xx The view up and out of the Tall Toilet. (*Oppenheimer Dean*)

‘ “We have the opportunity here to make the image or the face of a park,” [Andrew]

Freear told [Andrea Oppenheimer Dean] in the fall of 2003, “to make a new model for a park, not just let the county show up with cheap facilities and signs. We’ll give everybody something they can be very proud of, from toilets to pavilions, to signage, to trails.” The studio’s successful design for the pavilion convinced the park’s governing board to relinquish their initial idea of ordinary prefab toilets. They agreed to go along with the studio’s vision of toilets so unusual and grand that people would visit the park just to see them.’²⁰

²⁰ Ibid, p. 105. Andrew Freear is the current director of the Rural Studio.



Figure 3.xx The view from the Long Toilet, focused on a single tree. (*Oppenheimer Dean*)

Figure 3.xx The exterior of the Long Toilet, with its 30-foot cantilever. (*Oppenheimer Dean*)

One response to this fragmentation would be protect the area of the thesis site from further degradation by prohibiting buildings or other significant social uses so that nature as the highest and most threatened use can take its course. This approach would undoubtedly have a range of beneficial effects on the site itself. As the discussion of watersheds and ecological greenways has pointed out, however, the more landscape patches such as these are isolated from one another, the more the health of ecosystems at larger scales is at risk. Ecological health and biodiversity are enhanced by the free movement of water, plants, animals, weather systems and the like; leaving the North Woods site behind its barriers would be counter-productive to this goal.

In the social realm as well, the ability of each member to act in the interest of the group is advanced when those members have opportunities to explore and gain a larger understanding of circumstances beyond their own domains. It is part and parcel of the challenge of environmental stewardship that the ability to care for the environment is furthered by “being out in it”, with the wear and tear on the land that this entails. Given that the thesis site resides within the campus of a university whose stated goal is to advance the learning of individuals and society, a congruent approach is to explore ways in which the site may be used for educational exploration of the environment while protecting its general health and sensitive resources.

Following are a series of questions about the site at the landscape scale suggested by the thesis investigation:

How can design of the site further ecological connections with its larger context?

What areas of the site are especially sensitive and in need of protection from damage by human use?

How can design enhance unique features of the site for the benefit of the community without endangering those features?

How can the site meet the need for recreation in natural settings?

Does the site design perpetuate relationships between buildings and open space already established on campus, and if not, what new paradigms are introduced?

How does the design compose interactions with adjacent uses?

Given that environmental systems are dynamic rather than static, how can the site design make this evident?

CHAPTER 4

DESIGN AT THE SCALE OF THE BUILDING

CONCEPTUAL BUILDING SCHEMES

CONCEPTUAL SITE SCHEMES

PROGRAM AT THE SCALE OF THE BUILDING

BUILDING PRECEDENTS

DESIGN GOALS

CONCEPTUAL BUILDING SCHEMES

The aim of the parti investigation has been to generate configurations that:
Provide for the overall scope of each program unit
address areas of overlap between program units, and
respond to site conditions.

Leaving flexibility for multiple site possibilities means that the concepts will not address site response at a detailed level. The general ideal behind the concepts, however, is that they combine aspects of enclosure and prospect, and that they have the potential to respond to variation in topography. That parts of the program might detach and become separate structures is one aspect of this flexibility. Whenever a “building” is mentioned, it implies “buildings” as well.

CONCEPT ONE: THE STAIRWAY

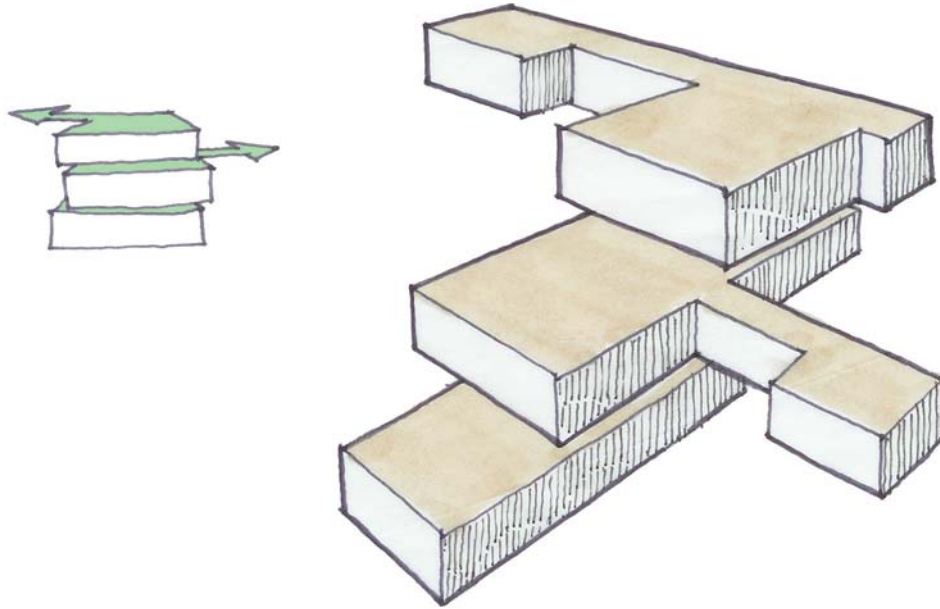


Figure 4.XX

The stepped massing of this scheme respond directly to the incline of the hill, supplying a stairway at a building scale through which to gain vantage points from higher elevations. This strategy allows the buildings a variety of means of touching the ground, the northern end of each mass digging into the hillside and becoming rooted in it, the southern end perhaps stretching out so far that it becomes a pier in a different spatial zone of the forest. The “outriggers” that house program extended out from the main mass become enlarged landings—opportunities for lateral movement and alternate ways of perceiving and moving into the landscape.

CONCEPT TWO: OPEN CORNERS

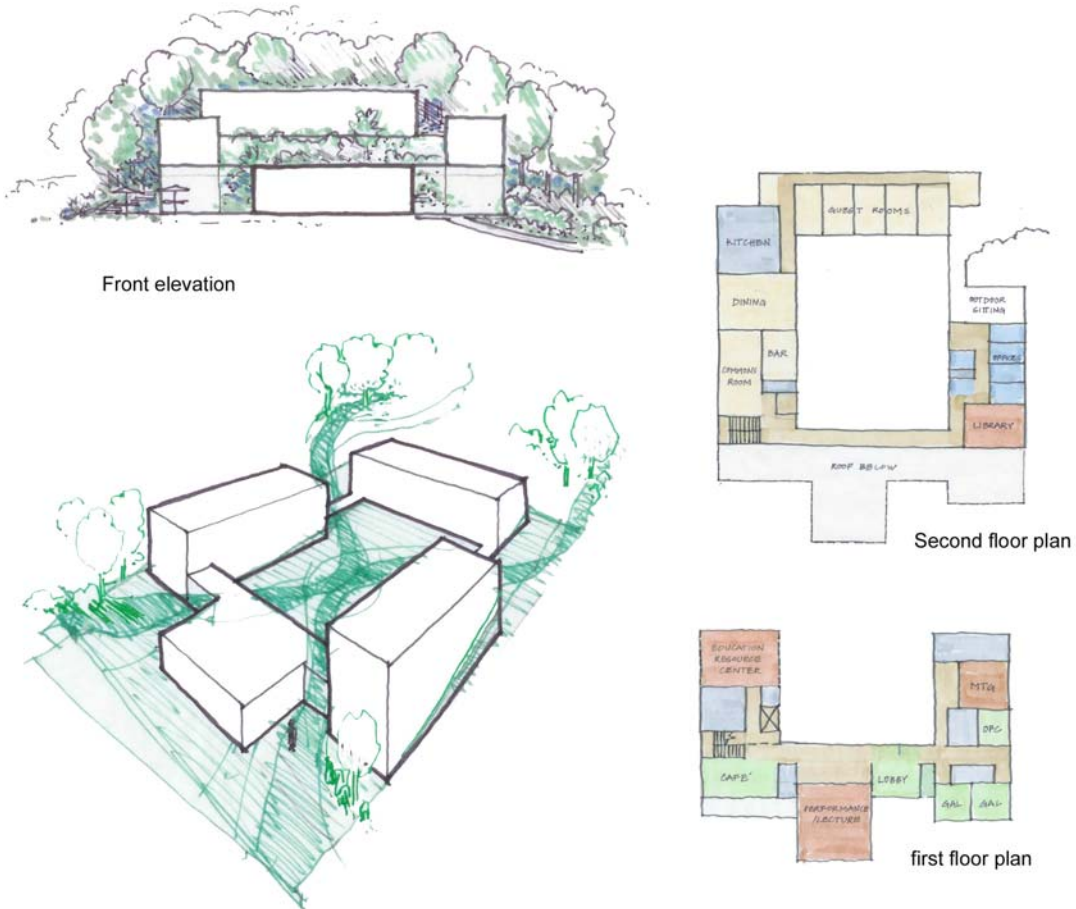


Figure 4.XX

The high-rise dormitory communities north of Byrd Stadium provide the starting point for this concept, in particular the open corners that allow spatial connection between the volume within the courtyard and the space outside it.

The configuration of the scheme presupposes a change in grade: possible scholar residences are on the highest level, the courtyard slopes down to the one-story foreground volume, and two-story bars on either side span the depth of the courtyard. There is considerable latitude for adjusting the masses in relation to one another, while continuing to express the idea that the landscape flows into and out of the courtyard and forms a special microcosm inside it.

CONCEPT THREE: THE BENT TUBE

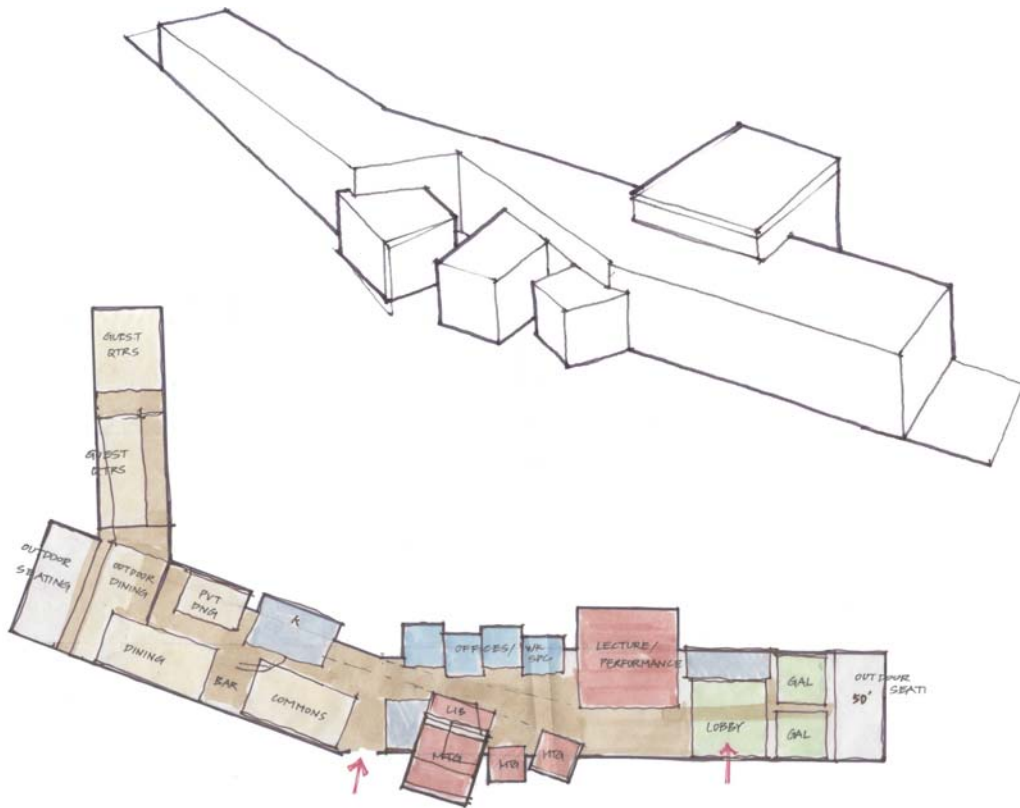


Figure 4.XX

The framework of this scheme is a hollow tube that organizes a main street and program disposed on either side of it. A contrast is posed between orthogonal organization and points where the alignment breaks out into a *more spontaneous set of relationships* pressing out into the landscape. These emerging volumes would provide a more clearly expressed sense of prospect; this sense would be present but somewhat suppressed in the volumes contained wholly within the tube. Materially the theme of prospect and refuge could be revisited through the alternation of translucent and opaque materials that defining the tube's surface and distinguish program spaces from the free space between them.

CONCEPT FOUR: THE BRIDGE

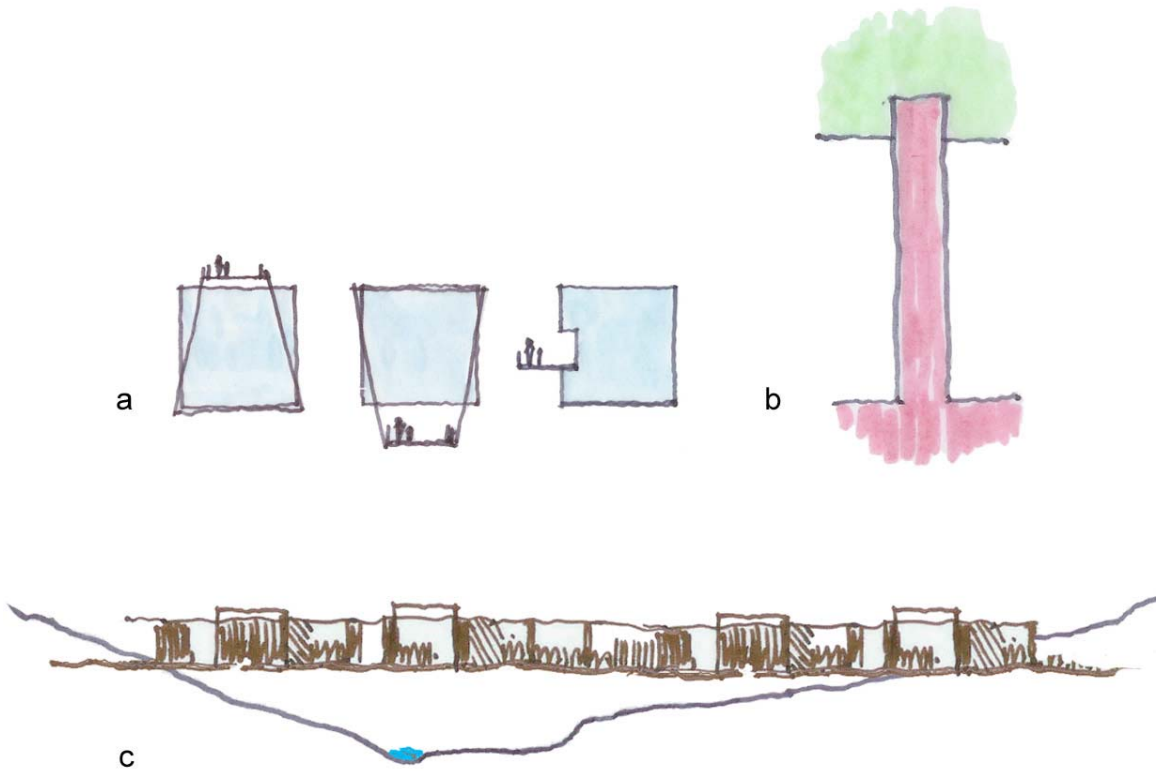


Figure 4.XX

Capitalizing on the structure enabling people to cross the creek, this scheme proposes that the bridge becomes filled with program. Program elements are sequenced to express their relative nearness to or separation from the 'civilized' south bank of the creek. Sectional diagrams (Figure 4.XX.a) illustrate ways that a cross-creek through-way could be placed relative to the rest of the building.

Figure 4.XX.b presents one possible role for a bridge/building in the larger context: that it emerges as an extension of the pre-existing built environment on the south bank of the creek, and its arrival on the opposite bank marks a clear contrast between the built and the natural. The diagram also highlights the similarity of this concept to the Bent Tube: this one moored while the tube has freer placement, but both conceived as relatively horizontal.

REVIEW OF BUILDING CONCEPTS

A factor that was significant in preferring one building scheme to another was the relationships that seemed preferable or optimal between the program units. The Stairway had an inherently hierarchical aspect, unless program elements were able to use various levels simultaneously. Detachment of one program unit from another was a concern with Open Corners, or it might require too much walking to maintain effective contact. Modifications to this scheme could include varying the masses of the east and west sides to bias a particular intersection, or special linkages might signal a circulation element. Bent Tube provided more opportunities in this respect, as interaction took place along one main venue. Lacking the main street except as an external walkway, the Bridge concept is at a disadvantage.

The degree of intro- or extroversion expressed by the schemes was another consideration. Open Corners seemed the most introverted, although opening up one or more of the corners might alter the dynamic. Stairway created the impression of receding up the hillside; how the outriggers were configured would play a role here. Bent Tube had a significant degree of flexibility in the expression of these qualities, depending on the direction from which the building was viewed. If Bridge performed an interesting acrobatic act as it moved over the creek, or if there was a way of moving laterally out from it, its reserved demeanor might be altered.

Finally, there were the topographical requirements of the site. Open Corners might have the most constraints in this respect, for moving from one wing to another was dependent on certain elevational relationships between them. The steps of Stairway could slide in and out to accommodate to a certain slope. The angle of Bent Tube was interesting for a similar reason, because it could be altered to wrap around a contour.

CONCEPTUAL SITE SCHEME

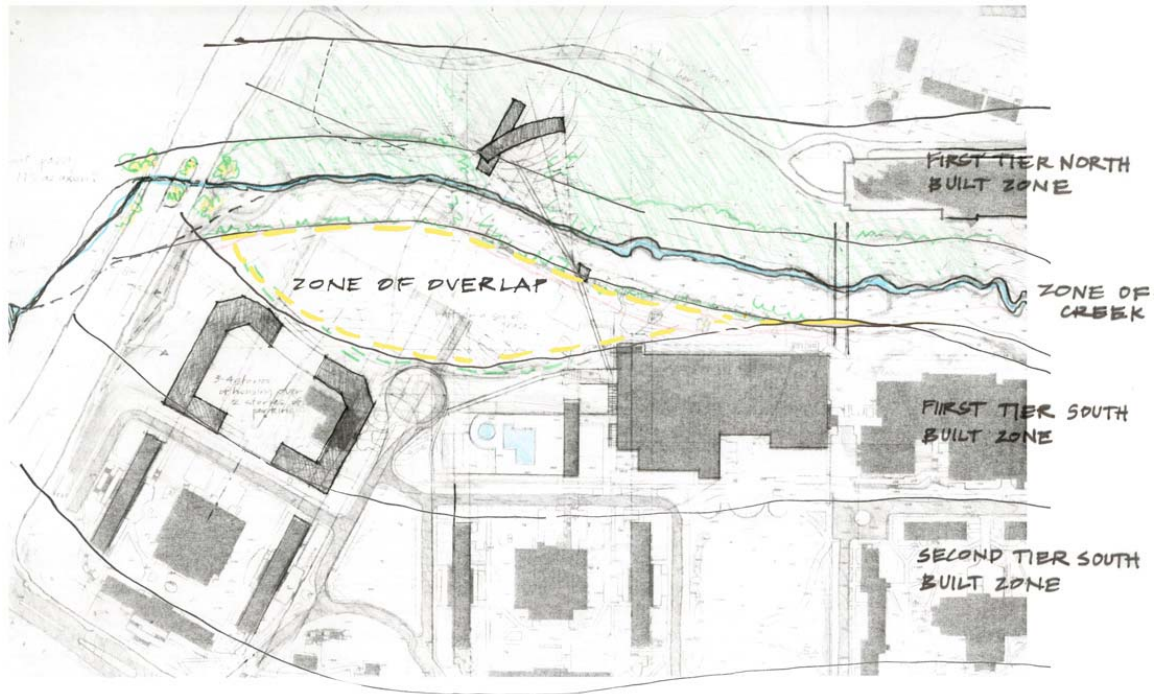


Figure 4.xx Diagram showing zone of overlap between 'natural' area of creek and Wooded Hillock, and the built fabric of the campus

Exploration of the setting into which a building scheme would fit, and a siting in which it made sense resulted in the diagram above, which rationalizes the area between the structures on the south and the wooded hill to the north. A building at the apex of the creek's northward arc made sense in that it was equidistant from University Blvd. and the Comcast garage, and, it would rest on a portion of the hillside that swelled forward toward the creek, creating a slightly higher elevation at that point.

PROGRAM AT THE BUILDING SCALE

A number of program types were explored for the thesis site. Student housing, a faculty club, a center that would allow non-profit organizations on campus to share office resources and personnel, and a performing arts amphitheatre were some of the possibilities considered. The site's off-the-beaten-track character did not invite uses that would attract people from all regions of campus, and other uses seemed too specialized to merit the uniqueness of the location. Given the site framework scheme, established earlier, that mandates less intense uses in proximity to the creek, student housing was eliminated though in other respects it made sense in proximity to other residence communities.

The proposed program draws connections between two undergraduate environmental science programs that currently exist on campus, and one that is in the development stages at the School of Architecture, Planning and Preservation (SAP&P). Given the increasingly inter-disciplinary and collaborative nature of environmental knowledge needed to address contemporary problems, the provision of a setting to encourage these connections would be an asset to the university.

Environmental Science and Policy (ENSP) was founded in 1998 and grew rapidly; it currently enrolls 200-220 students in a four-year curriculum. Students begin in the College of Agriculture and Natural Resources as they explore the possibilities of the major; once they declare their concentration within it, they move to that academic unit. The focus of the major is a cross-disciplinary understanding of the function and natural variability of earth systems, and how human activities and policies interact with them. Environmental Science and Technology (ENST) debuted in the fall of 2008, and is designed to appeal to students who are interested in direct engagement with the

technologies of environmental science. It groups two existing concentrations within the College of Agriculture and Natural Resources – Soil and Watershed Science, and Natural Resources Management—with two new concentrations- Ecological Technology Design, and Environmental Health – in a single major. In contrast to ENSP, which disperses students among four University colleges and schools, ENST is housed entirely within the Department of Environmental Science and Technology, a unit of the College of Agriculture.

Environmental Design and Planning approaches environmental issues from a spatial and design-oriented viewpoint, applying environmental knowledge, social and behavioral insights, and design principles to the design of communities. It will form a complement to the undergraduate architecture major, and share courses with it, but is designed to appeal to a more general student audience interested in environment and design but not committed to the design-intensive architecture major. Course offerings will be primarily through the SAP&P.

Program components housed in the new building will consist of these primary elements:

an introductory lecture/discussion course team-taught by faculty from the three programs, and required of all majors;

an elective sophomore-level studio that addresses subject matter common to the disciplines;

and a set of capstone courses undertaken by seniors and grouped according to discipline.

Thus the connections between the majors are fostered first at a very general introductory level, intended to introduce incoming students to the array of issues bound up in environmental science as a field; and then becoming increasingly specialized within a

common context. Other courses unique to each major would be held under the umbrella of the sponsoring school.

The common and collaborative elements of these three programs will be overseen by the Center for Interdisciplinary Environmental Research. This entity will handle administrative and logistical issues;

oversee the faculty teaching the courses;

act as a clearing house and base of support for ongoing projects that students and faculty will collaborate on;

bring in speakers and resident scholars in the environmental sciences; and represent the environmental sciences at the university to the public through events open to the public and interaction with government and private officials.

The Center will be run by a small staff housed in the new building, and sharing resources with it. At least two dedicated faculty members from each program will have offices in the new building, and will share the directorship of the Center on a rotating basis. Their primary research labs will remain in other quarters.

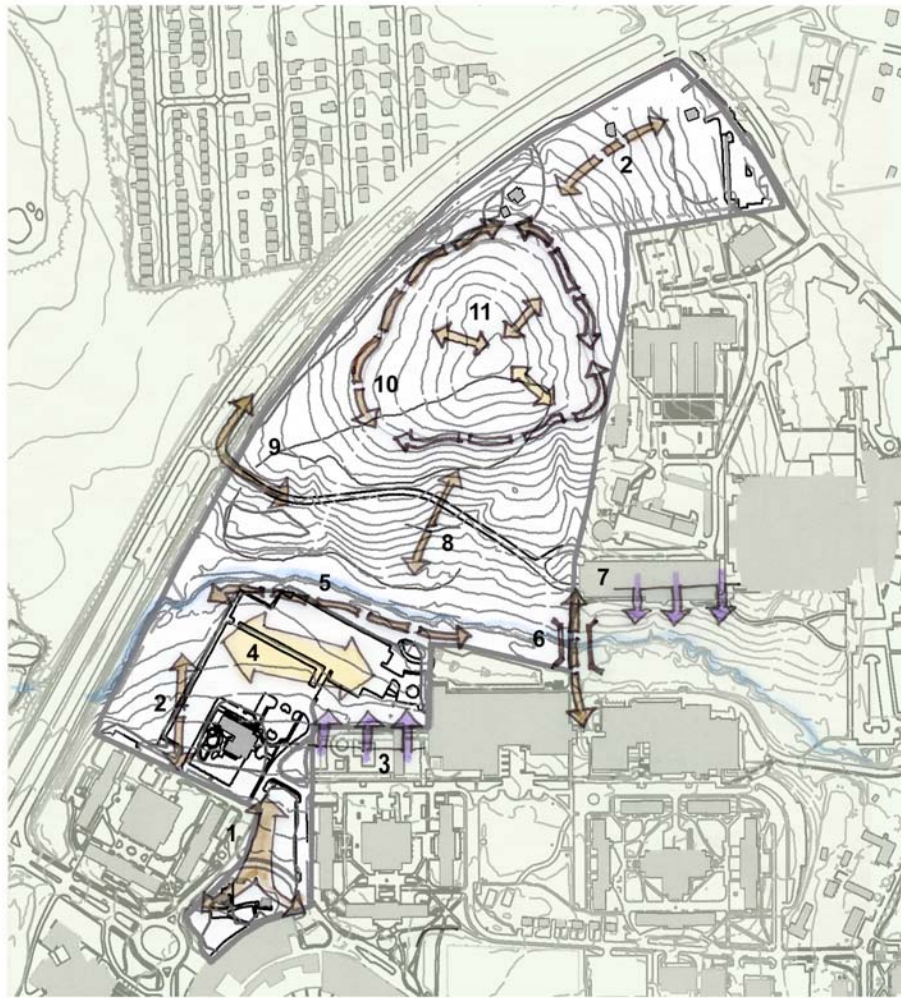


Figure 4.XX Some of the movement and activity types available on the site. (Author)

ESTIMATED TOTAL ENROLLMENT

ENDP	120 students
ENST	150
ENSP	220

Total 490 students

More than a quarter of this number will be freshmen. Additional students will be taking the introductory course to fulfill a core requirement.

PROGRAM ELEMENTS

Public

Lobby	600 sf
Interpretive exhibit area	500
Café	400
Lecture hall/performance space	2000
Multipurpose/prefunction space	1200
Restrooms	300 (2)
<u>Public subtotal</u>	<u>5300 sf</u>

Academic

Classrooms	
ENDP	750
ENST	875
ENSP	1200
Storage	1000
Offices	
Faculty members	500 (6)
Graduate students	800
Director	200
Assistant director	200
Support work station	100
Commons room	1200

Seminar/event rooms 800 (2)

Academic total 10,125 sf

Service

Kitchen for café (doubles as serving
kitchen for catered events) 400
Storage 600
Restrooms 200 (2)

Service total 1400 sf

Total program elements 16,825 sf

Mechanical (15 %) 2524 sf
Circulation (25%) 4205

Grand total 23,554 sf

PROGRAM PRECEDENT: THE AMERICAN ACADEMY OF ARTS AND SCIENCES
Cambridge, Massachusetts 1981
Kallmann McKinnell & Wood, Architects



Figure 4.9xx The northwest façade (Dillon)

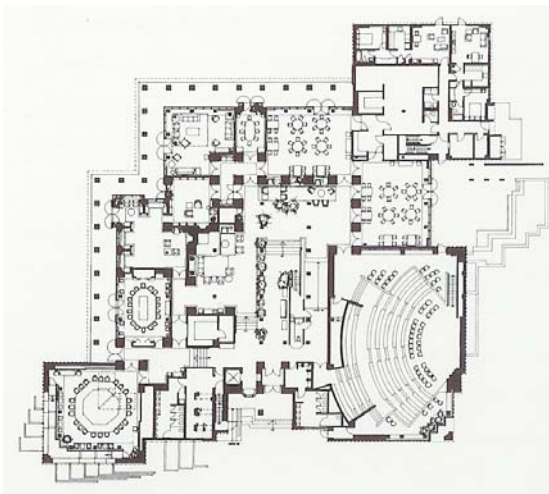


Figure 4.94 First floor plan (Dillon)

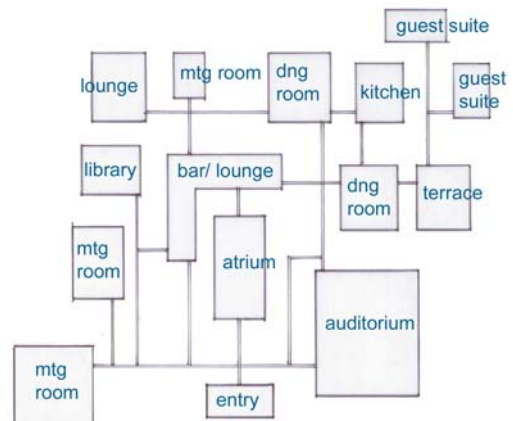


Figure 3.95 Program adjacencies (Author)

The American Academy of Arts and Sciences is a 225-year-old institution that was founded to conduct multidisciplinary study of compelling contemporary issues and to recognize exceptional achievement in science, scholarship, business and other fields.

PROGRAM PRECEDENT: THE WARREN SKAAREN ENVIRONMENTAL CENTER
 Round Mountain, Texas 2003
 Robert Jackson and Michael McElhane, architects



Figure 4.96 North façade (Spencer)

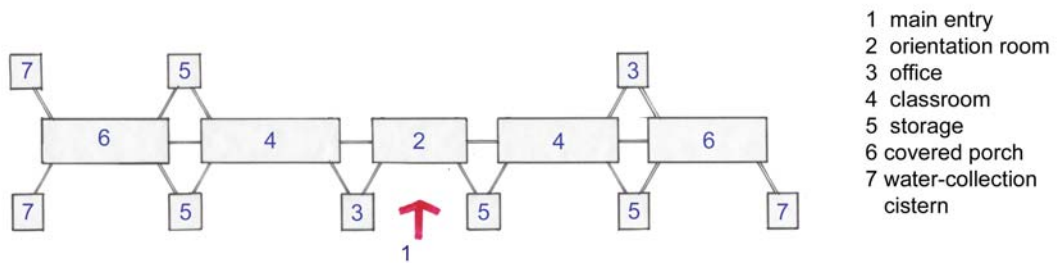


Figure 4.97 Program adjacency (Author)

The Environmental Center combines a solar control strategy with an open plan layout, flanking gathering spaces with cellular segregated-use spaces that aid in distancing the edge of the enclosure from the sun.

PRECEDENTS

The list of terms below was proposed as a series of characteristics that would refine the list of precedent projects appropriate to the subject matter of the thesis.

circulation

reception of light

connection to the site

materiality

relation to body of water

experience of interior

experience of exterior

views toward

views out from

connection of inside & outside

This is not to suggest that such issues as composition, structure and articulation were insignificant. The goal was for these more abstract characteristics to grow out of perceptual experiences of places and conditions. It was also intended to loosen the hold of particular sustainable strategies on the design process. Each precedent emphasizes certain characteristics on the list, and by default de-emphasizes others.

BUILDING PRECEDENT: THE MAEGHT FOUNDATION
Saint-Paul-de-Vence, France 1964
Josep Lluís Sert



Figure 4.xx On the left is a contemporary image of the walk to the entry, and on the left a view recorded the year after the foundation opened. The present condition is considerably more naturalistic. (*escapade-cote-azur.site.voila.fr* and *Brawne*)

Gallery owners and publishers Marguerite and Aime Maeght commissioned a building that would provide interior and exterior settings for their collection of works by contemporary artists, and that would harmonize with the sunny, dry climate of the French Cote d'Azur.



Figure 4.xx Light monitors (*Birksted*)

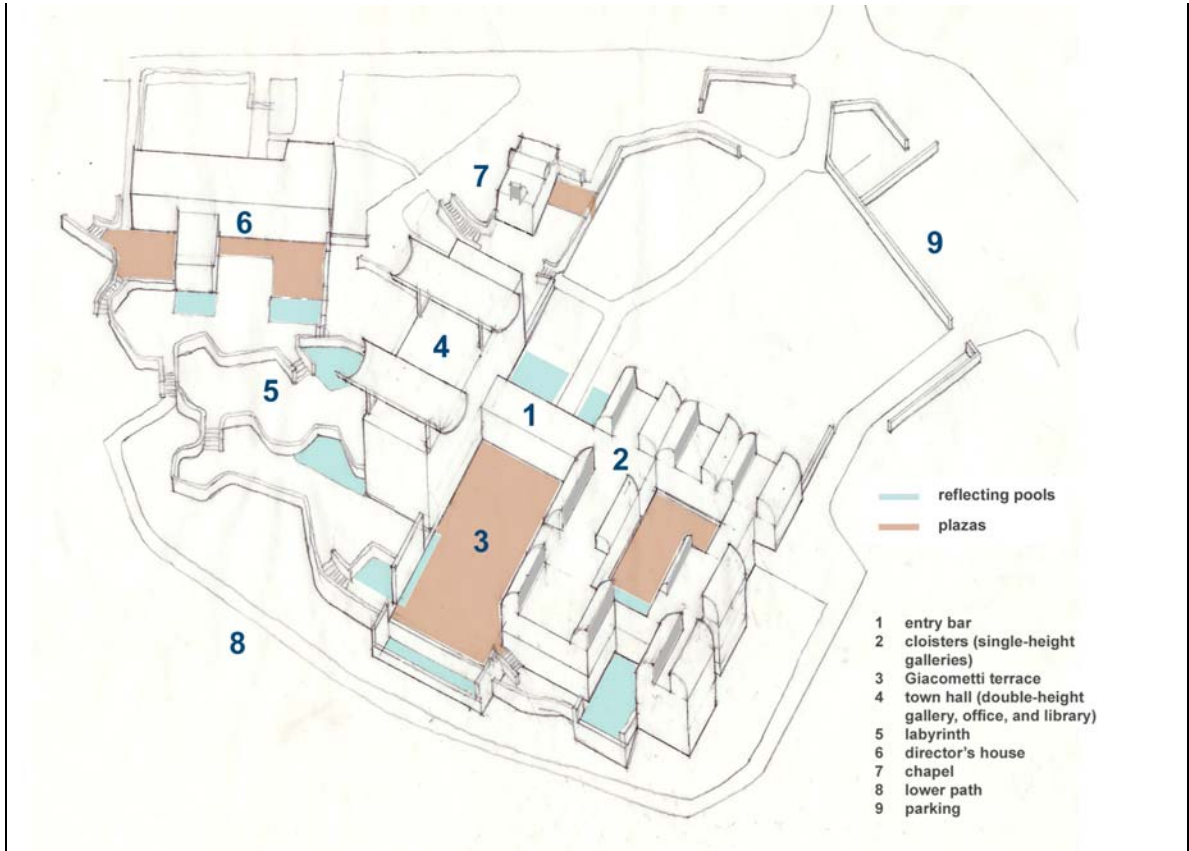


Figure 4.xx Axon of the site plan showing locations of pools and outdoor plazas. The design incorporates numerous strategies for capturing and storing rainwater, and recycling it through the pools. The expansive forms surmounting the town hall reportedly collect water also. (Author)



Figure 4.XX View across the pool at the end of the Giacometti plaza. (c20society.com)

Figure 4.xx Chutes for directing rainwater out from the valleys between the monitors can be seen projecting from the wall; note also the submerged 'barrels' for collecting the water.



Figure 4.xx The east façade of the town hall, illustrating the painted concrete and locally-cast bricks used for the town hall and the cloister. As can be seen in the monitor image above, Sert made a point of emphasizing the rhythmic pattern of the concrete formwork. *(Cheviakoff)*
 Figure 4.xx The chapel and another small building seen from the southeast. The rubble stone seen here is used for all terrace walls and outbuildings. *(escapade-cote-azure.site.voila.fr)*

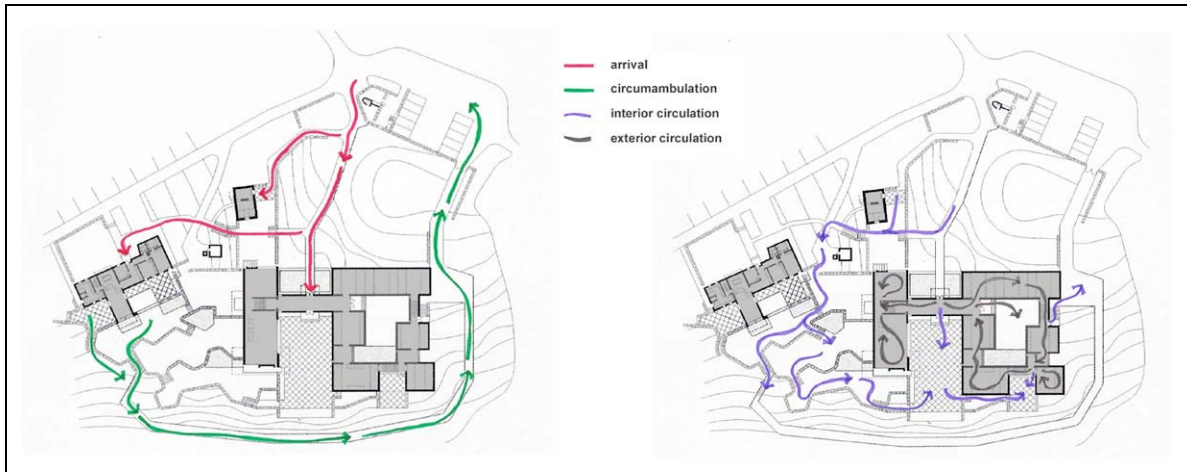


Figure4.xx Circulation patterns at the site and building scale. *(Author)*

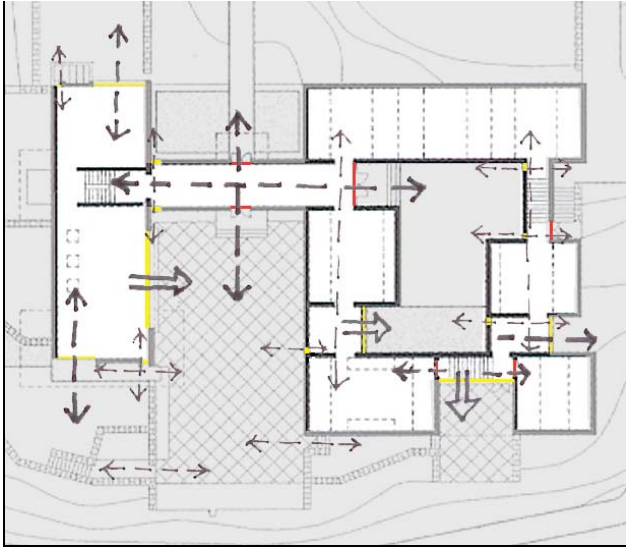


Figure 4.xx A plan diagram illustrating the intersecting lines of sight that are generated by slot windows and aligned doors. Other views of slot windows are shown in figures 3.xx and 3.xx. It is noteworthy that no photographs record the vista looking out of these narrow slots, though their influence on the experience of the building must be pervasive. (Author)

Fig. 4.xx A view through the entry corridor into the Giacometti plaza. The translucency of views such as this belie the weighty appearance of masonry, stone walls and concrete light monitors. (Birksted)



Figure4.XX The brise-soleil filling the large windows of the town hall. (c20society.com)

BUILDING PRECEDENT: "KIASMA" MUSEUM OF CONTEMPORARY ART
Helsinki, Finland 1998 Steven Holl Architect



Figure 4.xx An aerial view of the south façade. (Frampton)

The term “Kiasma” is Finnish for “crossing”, and was chosen by the architect to express “the intertwining of the building’s mass with the geometry of the city and landscape.”²¹

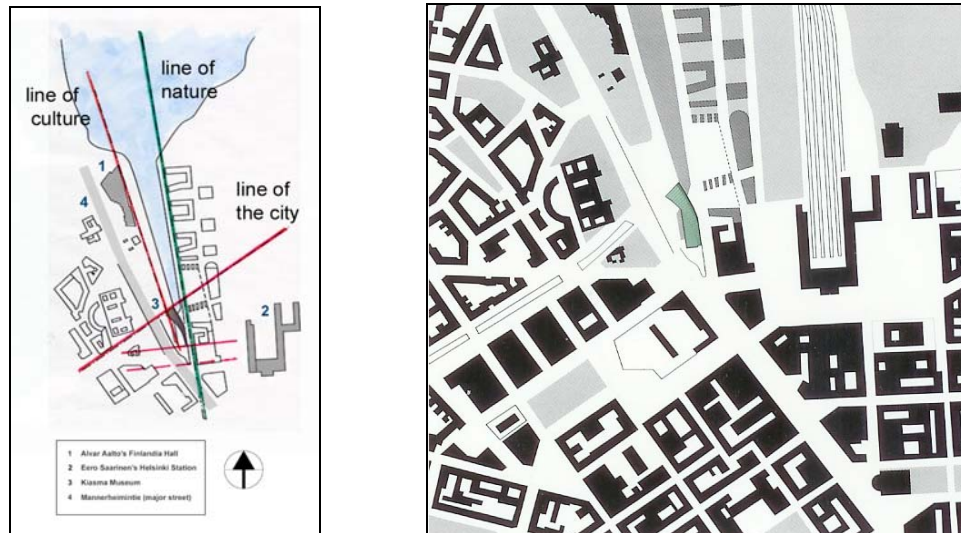


Figure 4.xx Holl’s depiction of the museum’s alignment with nearby landmarks. (Holl, author)

Figure4.xx The museum in the context of the heart of Helsinki. (Holl)

²¹ Frampton, Kenneth. Steven Holl Architect. Milan: Electa, 2002; p. 230.

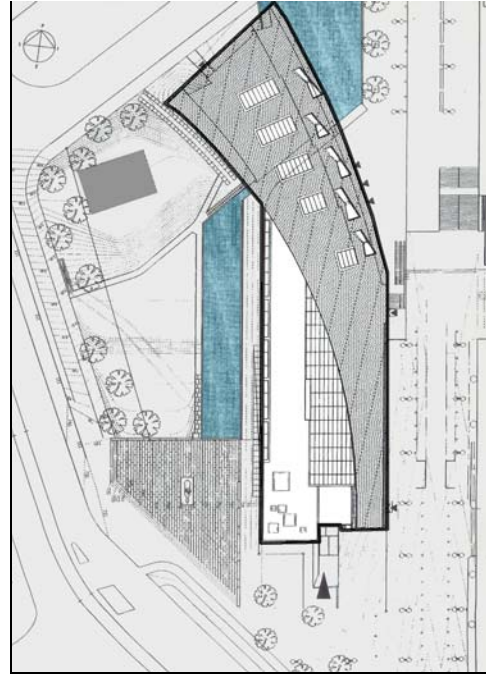


Figure 4.xx Inner corner of the west façade. (Frampton)

Figure 4.xx Site plan. (Holl)

One of the intrinsic and obvious features of the museum is the intertwining of the orthogonal and the organic. Visible in plan as well as from the exterior, the biomorphic volume of the west side of the building arcs over and subsumes the orthogonal east side. Orthogonal elements interacting with the organic introduces a considerable element of ambiguity, and prevents the establishment of either/or distinctions.

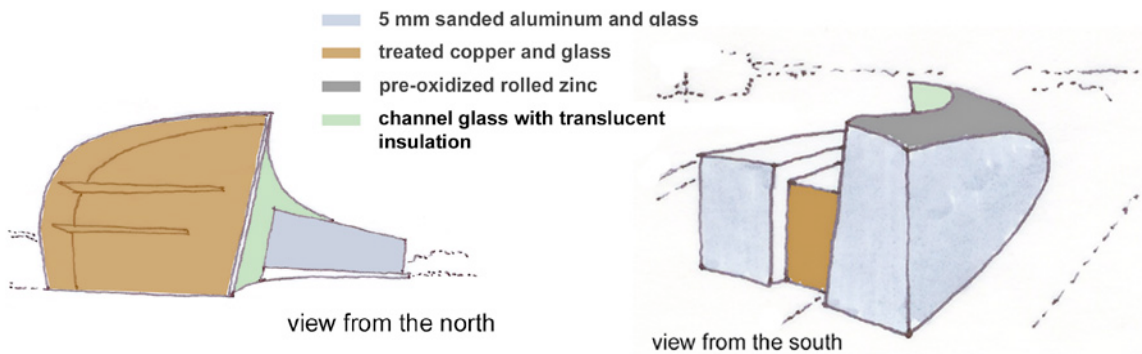


Figure 4xx Materials diagram. (Author)

The meeting of dissimilar forms is emphasized by the contrast of materials applied to each one. As before, these distinctions are not complete; for instance, the aluminum panels that comprise the cladding of the orthogonal form are also used on the biomorphic shape – but in areas where the shape has been seemingly lopped off to regularize it.

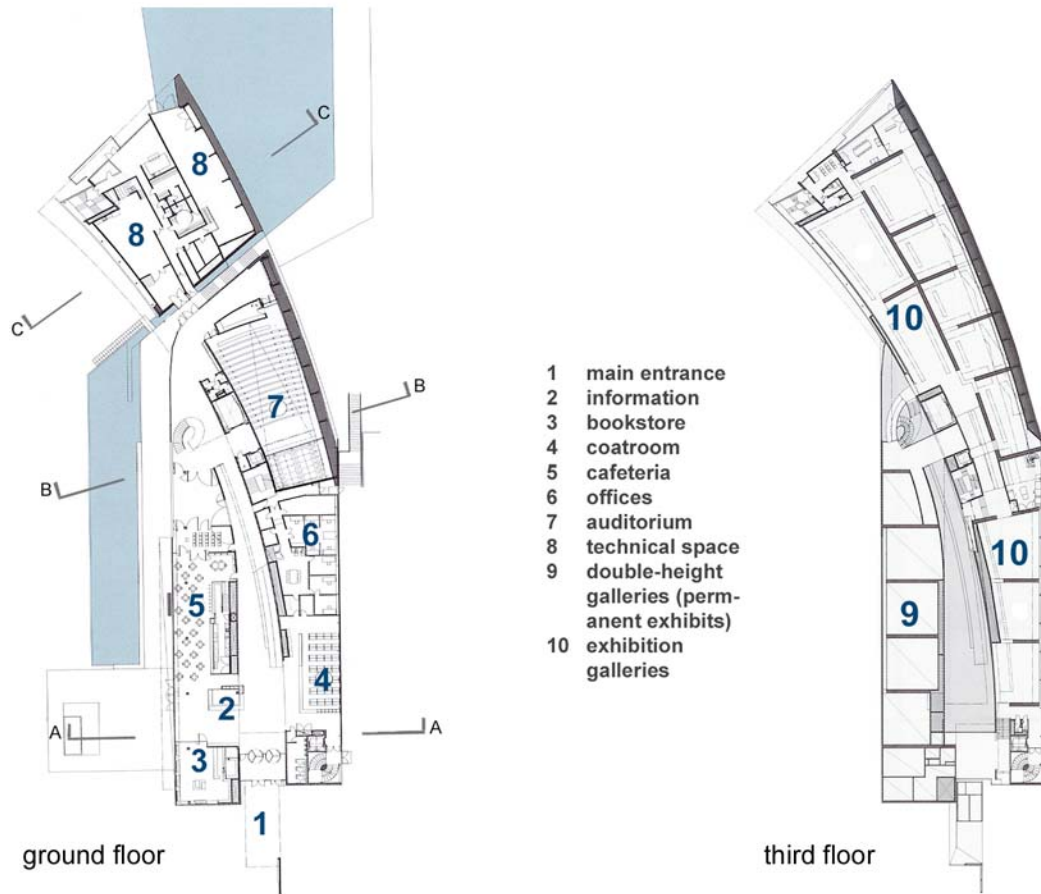


Figure 4.xx The first floor plan showing the water as it was designed to run under the building at ground level, creating another form of crossing. (This feature is not yet realized; from Google images it appears that the area northward is being cleared of buildings.) (Holl)
 Figure 4.xx Third floor plan. (Holl)



Figure 4.xx Ground floor circulation diagram depicting three means of circulating: (1) the ramp system, (2) the elevator, and (3) the asymmetrical spiral stair. *(Author)*

Figure 4.xx Ramps lining the atrium; the viewpoint is from the main entrance. *(Frampton)*

Figure 4.xx Winding stairs at the far end of the atrium. *(Frampton)*

The purity of line and relative absence of human-scale detail introduced in the atrium is carried into the galleries.



Figure 4.xx Views of galleries that are shaped by the curving west façade and roof. *(Frampton)*

These images, and the following sections, illustrate the variety of means that are used to bring daylight into the galleries. As shown in section AA, the skylight of the central

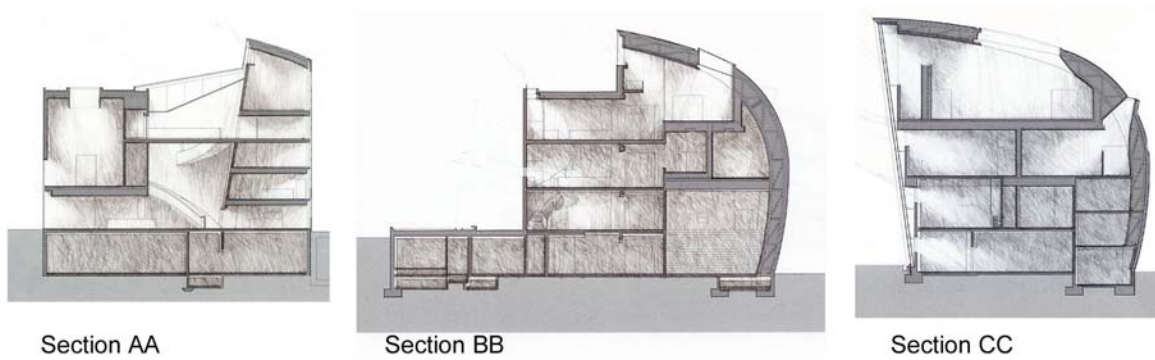


Figure4.XX East-west sections through the building showing daylighting. (Author)

atrium delivers light to the galleries to the west galleries as well as to the first floor. In section CC the effect of the 'bowtie skylights', designed to capture horizontal northern light and take advantage of the curving wall, can be seen. The 'ice wall' created by channel glass admits filtered light liberally on the west side, as well as transmitting it at night.



Figure 4.xx The west façade of the museum. (Frampton)

BUILDING PRECEDENT: ARTHUR AND YVONNE BOYD EDUCATION CENTER
Riversdale, West Cambewarra,
New South Wales, Australia 1999
Glenn Murcutt



Figure 4.XX East façade with the sleeping quarters in the foreground. (Beck)

The center is located on property in southeastern Australia used by the prominent artist Arthur Boyd as a painting retreat. The education foundation he established commissioned Murcutt to design a facility that could accommodate up to 32 students staying for several days at a time.²²

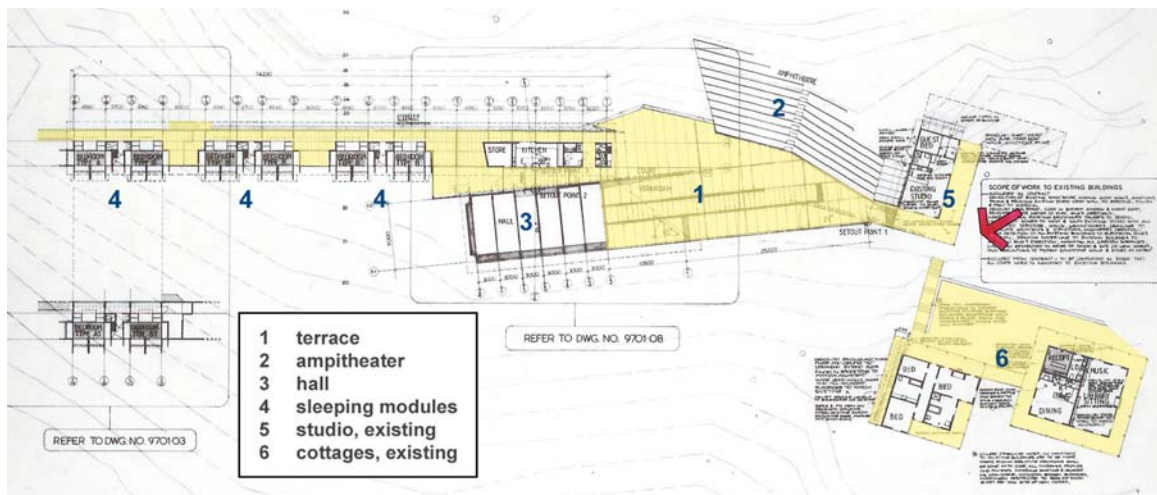


Figure 4.XX Floor plan with circulation highlighted in yellow. (Beck)

²² Beck, Haig and Jackie Cooper. *Glenn Murcutt: A singular architectural practice*. Victoria, Australia: The Images Publishing Group Pty Ltd, 2002; p. 182.



Figure 4.xx The butterfly hall roof, seen from below, elevates the building from the ground plane. (*pushpullbar.com*)

Figure 4.xx Seen from above, the roof seems to flex in response to the terrain, linking the building with it. (*archnewsnow.com*)



Figure 4.xx An aerial view of the site showing the relation of the buildings to the river and Shoalhaven Creek on the upper right. (*pushpullbar.com*)

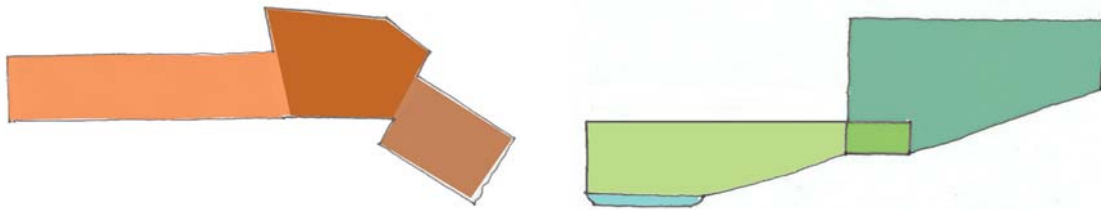


Figure 4.xx The terrace acts as a hinge between the existing buildings on the right, and the new building on the left. (Author)

Figure 4.xx In section the building "is poised between two landscape experiences: the native bush of banksias, cycads and turpentine looming above it, and below it the manicured and cultivated river flats."²³ (Author)



Figure 4.xx The portico roof framing a view of the Shoalhaven River in the distance. Rainwater is conducted down the pipe at the low corner and stored in huge tanks underneath the building. (www2.Hawaii.edu)

Figure 4.xx The hall as a space between the two planes of floor and ceiling that encloses the view. (Beck)

Figure 4.xx One side of a sleeping module, showing the panels that give the occupants many ways of framing the landscape themselves. (www2.Hawaii.edu)



circulation
admission of light
relation to site
materiality
relation to water
experience from inside
experience from outside
views toward
views out from
connection of inside
& outside

²³ Beck, Haig and Jackie Cooper. Glenn Murcutt: A singular architectural practice. Victoria, Australia: The Images Publishing Group Pty Ltd, 2002; p. 182.

DESIGN GOALS

Assuming that the responses to the pressing issues are going to be related and interdependent.

For the purposes of the thesis, an overall design approach will be understood to encompass several related goals, and to be formulated in response to the pressing issues outlined in the first chapter of this document.

Condition: Campus Creek has been undervalued and ignored, which has led to neglect and misuse.

Goal: To highlight in public awareness the presence of this local part of the watershed as its restoration unfolds.

Condition: Maintenance of an urban environment takes ongoing monitoring and involvement.

Goal: To invite public engagement with the local waterway and the ecosystems of which it is a part.

Condition: The varied environmental resources of the university campus are not working together for the benefit of the environment.

Goal: To provide effective settings for activities intended to galvanize the university's resources on behalf of the environment, both locally and at large.

Since the basic aim of the thesis is to support and enhance watershed restoration through architectural intervention, the general dimensions of this restoration will be

CHAPTER 5 DESIGN CONCLUSIONS



Figure 5.XX Utilizing the same view of the creek shown in chapter 3.



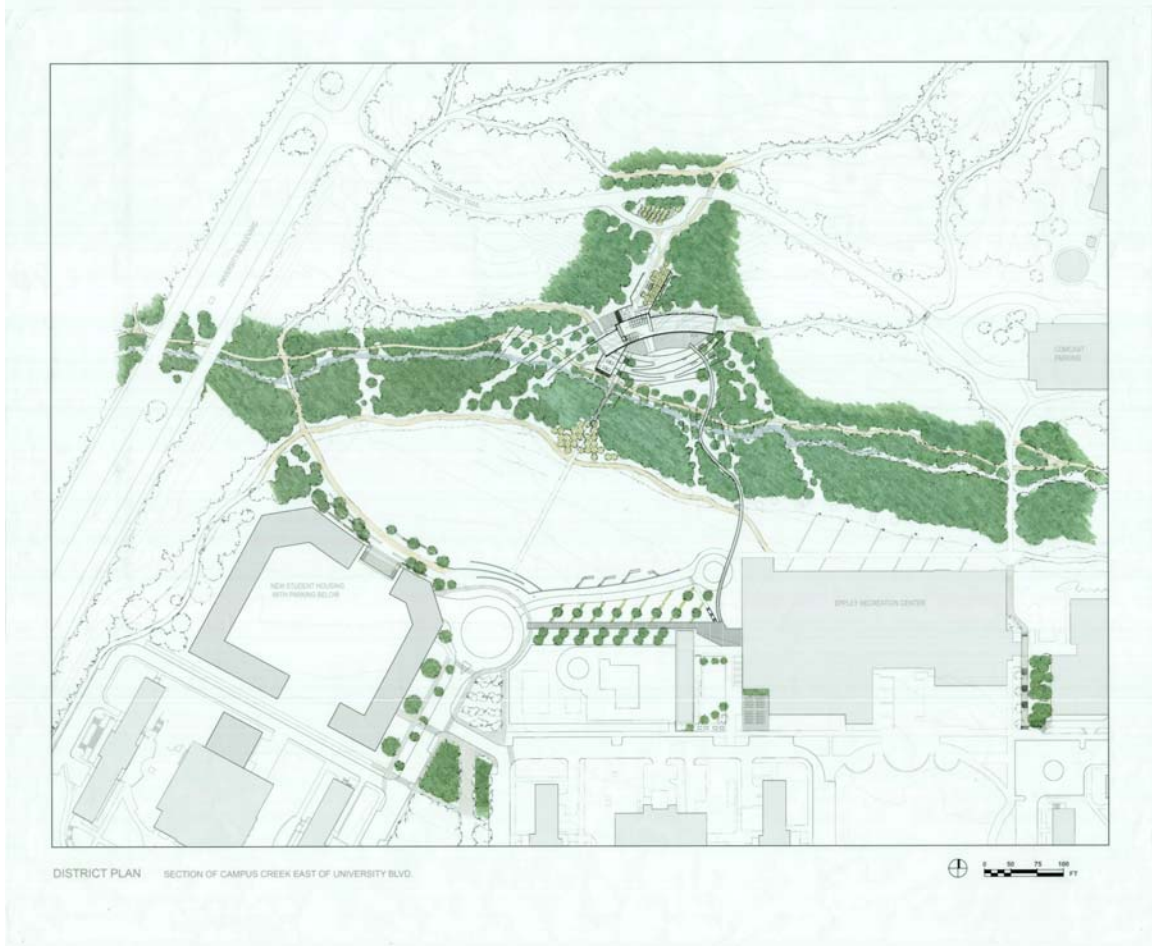


Figure 5.XX District plan (Author)

The district plan, above, illustrates the implementation of the site framework scheme described in Chapter 3. In addition to the Center, other new buildings are a student dorm to the southwest with parking below, and a service building allowing deliveries to be made from that below-grade garage.

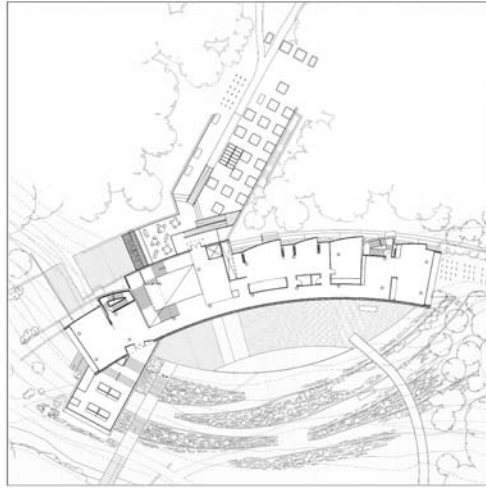
A buffer 100 feet wide on either side follows the creek along its trajectory. Openings in the buffer allow visitors from either direction a sense of what lies on the other side of the creek. The earth under University Blvd. has been excavated to allow the creek to flow from the golf course into the campus proper without being confined to a culvert, providing room for the passage of hikers and the migration of wildlife between sections of habitat. A trail along the creek's north bank is for hiking only, while cyclists as well as

pedestrians are welcome to use the other paths. Connections have been created between the site and the Wooded Hillock to the north, Comcast Center and garage to the east.

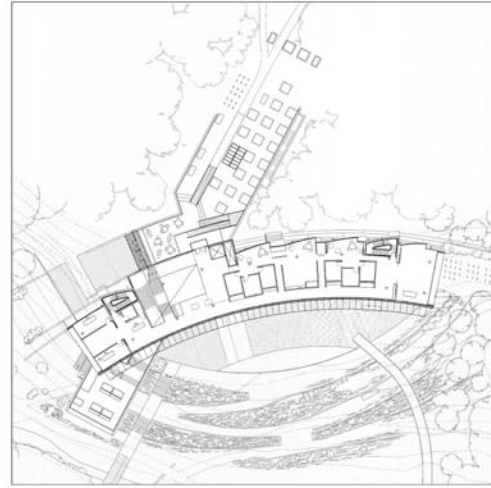
A rim has been created along the south edge of the meadow utilizing paths, benches, trees and ramps that provide ways of enjoying this wide-open natural space. Approaches from the south have been reorganized to give greater clarity and natural beauty to these pedestrian routes.



Figure 5.XX Site plan (Author)



PLAN, SECOND FLOOR



PLAN, THIRD FLOOR



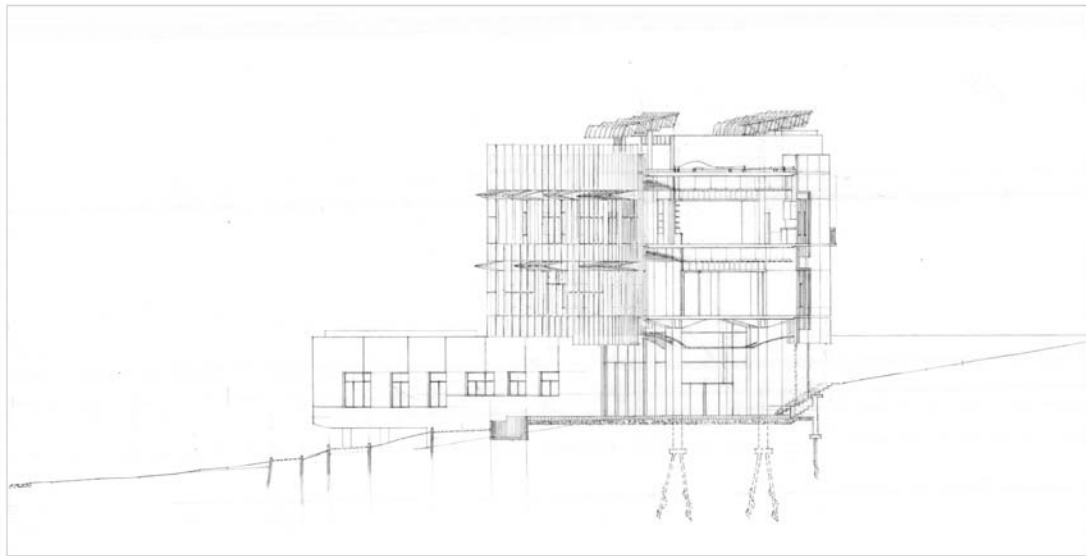
Figure 5.XX Plans of upper floors. (Author)



Figure 5.XX Looking north to building along air bridge. (Author)



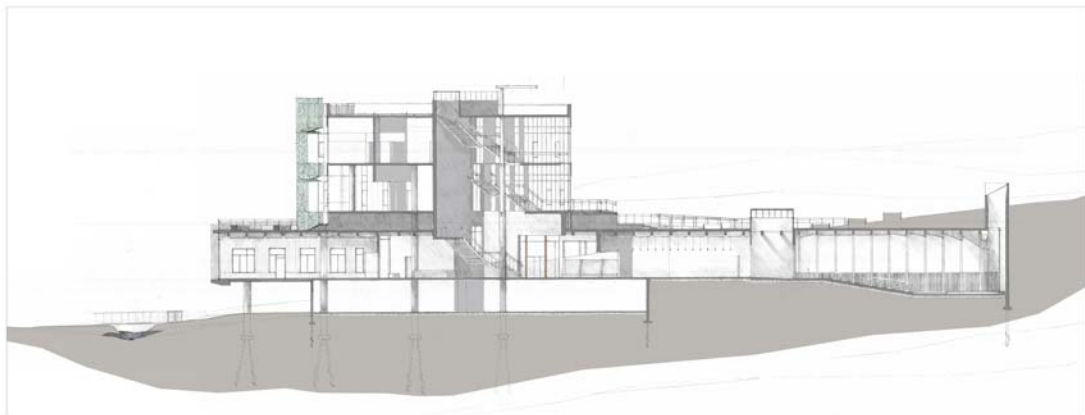
Figure 5.XX Section A-A north-south through site. (Author)



SECTION B-B THROUGH CURVED BAR AND HILLSIDE



Figure 5.XX Section B-B through curved bar and hillside. (Author)



LONGITUDINAL SECTION THROUGH GROUND FLOOR



Figure 5.XX Longitudinal section through the straight bar showing the portions of the building elevated over the creek on the south, and the auditorium below grade on the north. (Author)



SOUTH ELEVATION

© 2012

Figure 5.XX The south elevation showing the view up the hillside under the curved bar.

(Author)

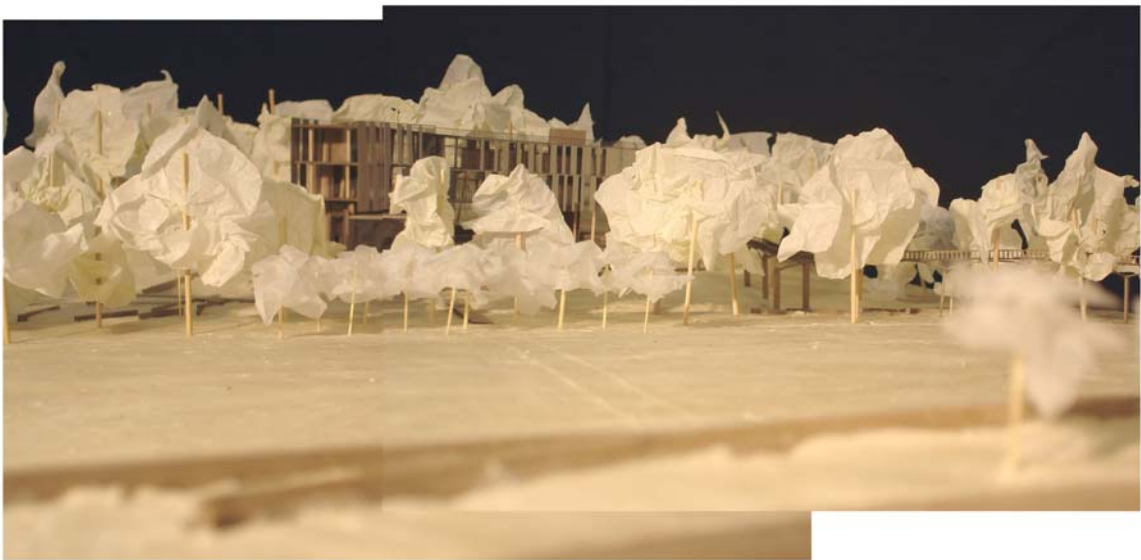


Figure 5.XX View of the buffer and building from the south edge of the meadow.

(Author)

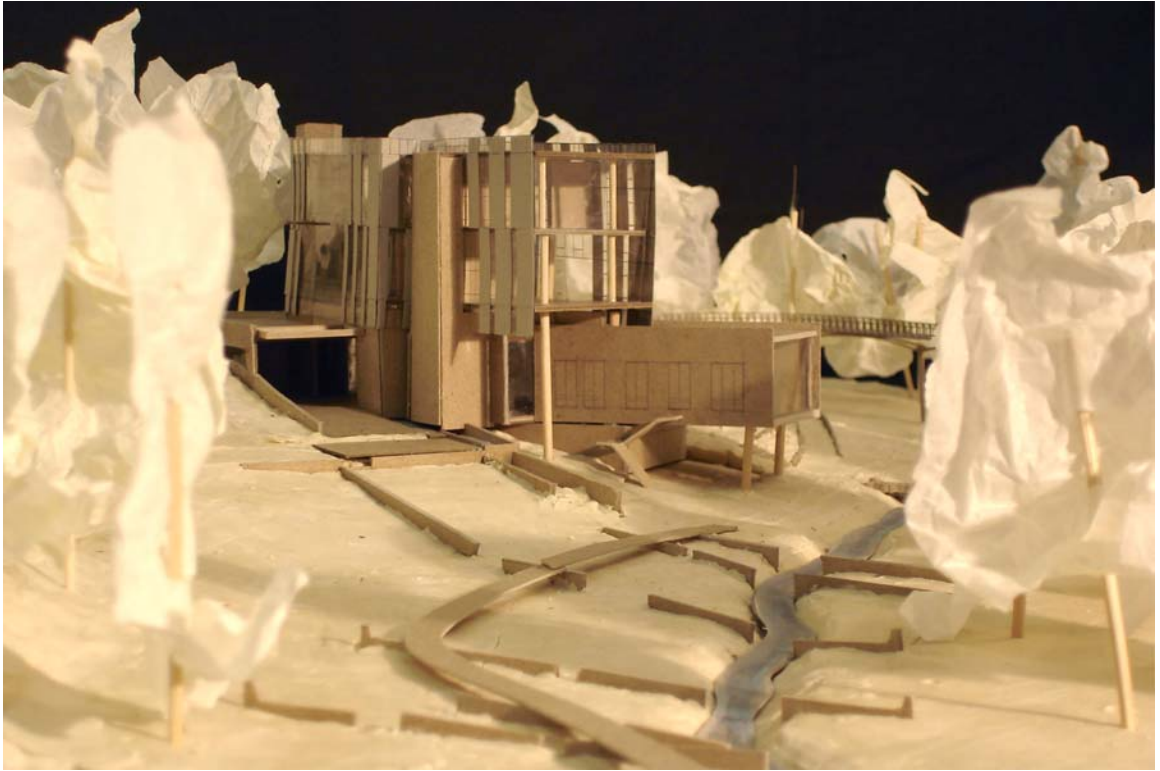
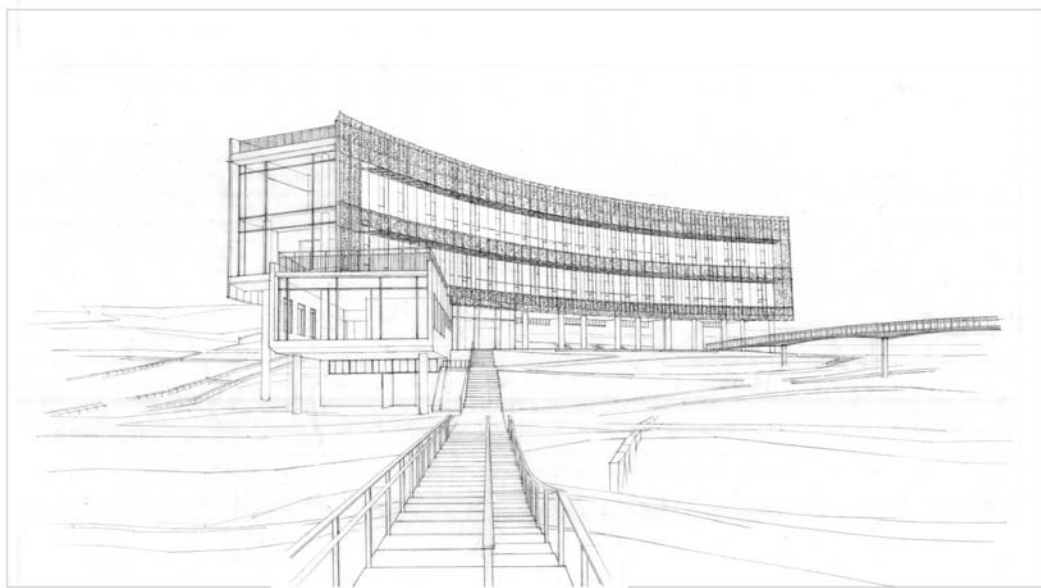


Figure 5.XX The view east along the creek. (Author)



PERSPECTIVE FROM SOUTH

Figure 5.XX (Author)



Figure 5.XX View west past air bridge, showing weirs intersecting the creek. (Author)



INTERIOR PERSPECTIVE ATRIUM, LOOKING EAST

Figure 5.XX Interior perspective on the second floor of the atrium, looking east. (Author)



Figure 5.XX View from the east approach through the woods. (Author)

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