THE SUSTAINABLE MOVEMENT AND THE FUTURE EFFECT ON CAMPUS DEVELOPMENT FOR THE UNIVERSITY OF GEORGIA

by

DANIEL E. SNIFF

(Under the Direction of Judith Wasserman)

ABSTRACT

Campuses across the country are developing sustainable principles as the building blocks of the twenty-first century. The University of Georgia is lagging behind the higher education community in the area of sustainable planning, construction, and academic development. With an understanding of the factors that changed and effected campus development in America over the course of three hundred years, this thesis will illustrate that campuses are not static places, but constantly changing institutions that reflect our society. Great changes in history have brought about change on campuses and the sustainability movement is the next great change agent effecting campus life. By studying what planning processes have failed and which ones have succeeded, a course of action for developing sustainable guidelines can lead to acceptance. A case study of The University of California at Merced will demonstrate how campuses can succeed if a holistic approach is developed and the institution is committed.

INDEX WORDS: Sustainable, Guidelines, Principles, University of Georgia, Design Process, University of California Merced

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DANIEL E. SNIFF

BARCH, University of Tennessee Knoxville, 1984

MBA, Brenau University, 1997

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF LANDSCAPE ARCHITECTURE

ATHENS, GEORGIA

2008

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DANIEL E. SNIFF

Major Professor:	Judith Wasserman
Committee:	Robert Alfred Vick Paul Dexter Adams F. N. Boney

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
May 2008

DEDICATION

In my life I have discovered that all good things come from the family. I dedicate this thesis, all the effort that went into it and all my work before this to my family. To my wife, Joyce, who has shown me love beyond all my imagination, thank you. You told me long ago that within your depths was a woman worth getting to know, all I had to do was spend the time and let myself love you - what an understatement that was! You mean so much to me; how right you were. To my beautiful, talented, smart, caring daughters whose world I must work to change, Ashley Sarah, Erin Elizabeth, Rylee Beauvais, and Sydney Mahala; girls, daddy can finish the playground now.

To my mom and dad whose shoulders I stand on, all I am, I am because of you. For all of your sacrifices for me, my brothers and sister, thank you. I cannot count the times both of you encouraged me; never saying I couldn't do or be whatever I put my mind to. Thank you for all the times you did not give up on me when others dismissed me as a lost cause. To my brother Don, who after seeing my exasperation with education, filled out my application to undergraduate school and mailed it; I owe you more than you possibly know. To Dave, who made life fun, who I looked up to, and who cut trail for Don and I, thanks. To my sister Denise, whose trademark is her ambient smile, her sense of humor and her deep love for her family. I am so very lucky and grateful to all of you. I am mindful of my grandparents whose education was so very limited because of circumstances beyond their control. They cultivated the values, which are my definition of family, hard work, perseverance, and because of them, I now can stand on the stage with scholars. This is in remembrance of them.

ACKNOWLEDGEMENTS

I must first acknowledge Dr. John (Jack) Crowley who talked me into this adventure. It was worth every drop of sweat. To Joyce who, even through was pregnant at the time I applied for graduate school, gave me her blessings. She knew all to well she was part and parcel a student alongside me but never faltered in her support. She edited my work, stayed at home with Rylee when I was off being a student, encouraged me, had a keen interest in my classes, learned alongside me and was a tour-du-force on this thesis. Our next child, Sydney, almost killed the deal; but Joyce rallied and never gave up, and today this degree, my degree is hers as much as mine. To my rock, I acknowledge your strength.

To Ashley and Erin, I know there were times you needed our attention or help and had to wait. I hope you understand how much we want to make the world a better place for you. Thanks for all the babysitting and for loving your sisters so much. I need to also acknowledge my parents. In the nurturing of Rylee and Sydney, we are a true expression of an extended family. Thanks for giving us the good night sleep we so often needed!

I must thank my colleagues in the Office of The University Architects, Scott Simpson, Kevin Kirsche, Linda Henneman, Paul Cassilly and the rest who supported me when I attended class. I would also like to acknowledge the talented faculty of the Landscape Architecture School. You all proved that you can teach an old dog new tricks.

To Judith Wasserman, who has been an invaluable sounding board and an understanding professor when I had to attend class with a infant. I own her a debt of gratitude, and I hope her life is full of happiness.

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CHAPTER 1

SUSTAINABILITY AND THE NEED FOR SUSTAINABLE PRINCIPLES

Preface

The American campus is not a static plat of land or an unchanged collection of buildings but an ebbing pallet that adapts to the needs of the user. Just like the pedagogy change from the Socratic Method to the elective curriculum of the mid nineteenth century and the demands of the industrial revolution, campuses have morphed to accommodate change. Whether it was social demand, like the introduction of women in the early twentieth century, or the World War II GI Bill, that spurred a building boom during the mid twentieth the century, colleges have been instruments of change. The future fundamental impact to college buildings, grounds, and curriculum is the sustainability movement. Campus leaders are becoming aware of the facts and must adopt sustainable practices that will change all aspects of campus life.

The application of sustainable development principles to facilities and grounds master planning is becoming increasingly accepted throughout college campuses across the country. By studying and understanding the factors which comprise a sustainable development plan, The University of Georgia will come to appreciate that sustainable planning processes should be the foundation for future planning efforts on the Athens campus. The historical analysis of the development of the American campus provides an understanding of how campuses evolved from traditional forms to current patterns. They changed to meet the demands of an ever growing intellectual climate, American society and educational philosophies. The next major inflexion point of change to the American campus is sustainable development as a response to environmental concerns. This

process of planning can be accomplished through a committee structure that will yield a holistic and inclusive sustainable plan. The University can proceed with a Sustainable Development Plan that will be cost effective, operationally efficient, reduce the carbon impact of our population on the planet, and support the education mission.

Higher Education Planning and Possible Results

Academic planning, strategic planning and physical plant planning are the triad of college and university physical development. Academic and strategic planning first establish the parameters and direction of the college's mission and growth. The campus planning team, which is comprised of a myriad of professionals including academics, landscape architects, architects, land planners, city planners, and policy makers, design a physical environment that supports and compliments the university's mission. With our society rapidly depleting the natural resources that sustain our planet, campus designers have the ability to incorporate into the design of the buildings and grounds methods of protecting nonrenewable resources. The planning team should establish principles, guidelines and policies of sustainable design with the expressed goal of conserving, protecting and restoring the earth's natural systems.

Establishing and adopting sustainable policies that require an integrated and holistic approach to design exhibits not only good stewardship to the environment, but also good economic strategy. Additionally, in the realm of college and university architecture, sustainable design can serve a dual role: first, in a broader role of environmental responsibility, and secondly, as an educational tool for future generations. Demonstrating new construction practices, storm water and ground management approaches, and resource efficient technologies can become an important education experience for future policy makers.

A tenet of modern thought states that architectural form reflects the cultural aspirations of society. Nowhere is this reflection more recognizable than in the architecture of the American college and university campus. (Vickery 7) If this statement is true, then what is the role of the campus planner in society? What lasting effect will the development of a sustainable campus have on society? What ethical responsibility do planners have to the students, facility and citizens? If the function of higher education is to enhance the intellectual climate and strive to educate, then is it not the role of the campus planner to provide academic scholars with buildings and grounds that do the same? If the soil and grounds of a campus are the foundation, and the buildings are the structural bones, then the skin and fabric that wrap and hold it together are the faculty, staff and students. Colleges and universities are in the unique position to reshape the thinking of a whole new generation with every freshmen class. The application of sustainable design to campus buildings and grounds would be a learning tool. These lessons inculcated over many years could alter the next generation's outlook on our limited natural resources.

Definition of Sustainability

In order to clearly establish sustainable principles that guide the planning process, a definition of what sustainability means would allow future design professionals a foundation from which to work. The following are definitions of sustain and sustainable development from various sources:

> Sustain: 1.To keep in existence; maintain. 2. To supply with necessities or nourishment; provide for. 3. To support from below; prop. 4. To support the spirits, vitality, or resolution of; encourage. 5. To endure or withstand; bear up under: *sustain hardships.* 6. To experience or suffer (loss or injury) 7. To affirm the validity or justice of: *sustain an object*. The American Heritage Dictionary of the English Language, Copyright 1992.
>
> Sustainable Development: Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. United Nation World Commission on Environment and Development (The Brundtland Commission), Our Common Future, 1987.

> Sustainable Development: a process in which qualitative development is maintained and prolonged while quantitative growth in the scale of the economy becomes increasingly constrained by the capacity of the (eco) system to perform over the long-run two essential functions: to regenerate the raw material inputs and to absorb the waste outputs of the human economy. Herman Daly, World Bank.
>
> To provide a secure and satisfying material future for everyone, in a society that is equitable, caring & attentive to basic human needs. UBC Center for Human Settlements, May 1989.
>
> Our vision is of a life sustaining earth. A sustainable United States will have a growing economy that provides equitable opportunities for satisfying livelihoods and safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the function and viability of natural systems on which all life depends. The President's Council on Sustainable Development, 1996.

Sustainability or sustainable development has a wide range of meanings to different people. The interpretation also differs depending on what message is being conveyed. It is not my intention to add to or take away value from any of the above definitions, but it is my opinion that sustainability is defined as not living beyond what our environment can support. My role as an architect is to design buildings that are responsive to sustainable philosophy – buildings that do as little harm to the environment as technologically possible within the limits of budgets and expectations. Client education about sustainable principles is essential, so together we can look to the next generation of owners, users, and decision makers and say we were responsible.

CHAPTER 2

A BRIEF HISTORY OF CAMPUS DEVELOPMENT IN THE UNITED STATES FOCUSING ON THE UNIVERSITY OF GEORGIA

The Colonial Period through Early Statehood

The history and evolution of American institutions of higher learning are intimately tied to the land and visions of an Elysian landscape. This is in direct contrast to its European counterpart. Oxford University in England was established around 1096 and is the oldest English speaking university. The University of Georgia, which is the oldest state charter University in the United States, was chartered in 1785. By analogy, Oxford would be considered great-grandfatherly. Despite the desire to achieve similar missions of providing advanced education for some of its citizens, the physical growth of the European campus developed with strong ties to the city; its American counterpart typically developed at a distance from urban centers. "The founders of early colleges argued that the corrupting influences of alcohol, gambling, and other vices associated with the city cold be avoided by locating universities in rural locations." (Kelly 1) Additionally, it was surmised that the fresh air and plentiful land found in the wilderness would insulate against disease while providing natural resources for the maintenance of the institution. (Kelly 2)

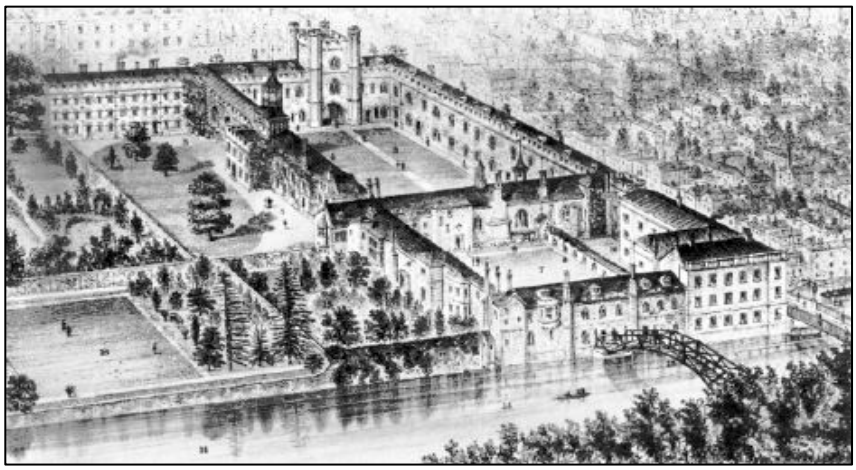


Figure 2.1: Cambridge University

Many of today's most prestigious institutions have their roots in humble beginnings. The frontier proved to be an ideal location for schools such as Dartmouth College, the University of Notre Dame, the University of North Carolina at Chapel Hill, the University of Virginia and The University of Georgia. At the University of Georgia, the first building commissioned by Josiah Meigs in 1801 was "an indigenous log structure twenty feet square and one and one-half stories high." (Bowen 22) The modest frontier beginnings of these institutions were indicative of the young country itself.

The University of Virginia, at Charlottesville, Virginia, is one of the most studied campuses in America. Towards the end of Thomas Jefferson's life, he tirelessly worked to design and construct what he referred to as an "Academical Village". Jefferson's attention to detail included the grounds, which complimented the architecture. He intentionally used architectural metaphors, like the Rotunda that crowns the lawn, which was modeled after Hadrian's Pantheon in Rome. The Romans constructed the Pantheon to be a temple to all of the gods; Jefferson's Rotunda was a library or a temple dedicated to knowledge. The pavilions, which flank the Rotunda, were demure "good soldier" buildings that humbled themselves to the

greater good, that being the lawn and the Rotunda. The ten pavilions were aligned to define an edge and reinforce the lawn. The walkway edge and the edge of the pavilions' facades are connected with a covered walkway that is a metaphor for the "public street". (Dennis 4) The walkway or, in an urban context, sidewalk is the edge and beginning of the lawn. The lawn is equivalent to the "public green" or "Town Square," the common space where a city's citizens could gather for activities ranging from mercantile purposes to conducting government business. The areas behind the covered walkway and pavilions are private and connected to gardens that are meant for the occupants of their respective pavilion. These walled off gardens offer fine areas of repose and sanctuary. The lawn is the counterbalance to the gardens and so much more than an open green grass space that separates buildings. It embodies the concepts of Jefferson's views for America " –a neoclassical ideal- 'adapted to the circumstances of the place' like the American Constitution it is an elegantly balanced debate between public and private interests." (Dennis 4) Jefferson, always cognizant of the meaning behind his design, used the dynamic tension between the public and private realm to define his vision of the American university.

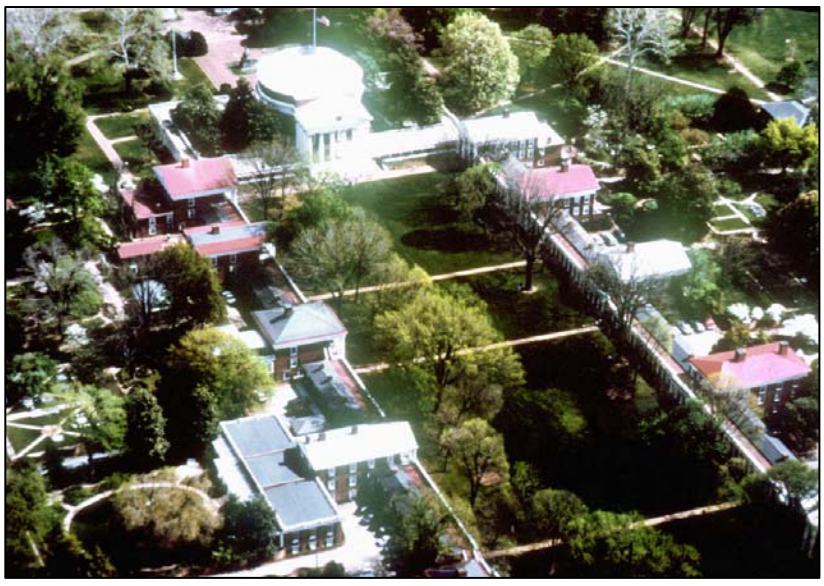


Figure 2.2: The Lawn at The University of Virginia

Figure 2.3: The Lawn at the University of Virginia

The University of Georgia's founders, like many other fledgling University trustees, never saw their institution as a rustic outpost for intellectual ideals. During the early years of the University's development, Josiah Meigs, the second president and chief architect, labored to design and promote the University as the pinnacle of knowledge in the state of Georgia. Like-minded intellectuals and planners across the country, in what might be seen as an attempt to lend higher status to their creations, used the classical world of ancient Rome and Greece as their motifs. New towns founded in America became known by the names of Rome, Syracuse, Carthage, Troy, Ithaca, and Athens. During the early 1800's, Greek Revival architectural styles reinforced the connection between these distant places and their new-world namesakes. These old world seats of democracy became the new nation's model. The new experiment in a form of government that had been muted for almost a thousand years gave promise to a great new society. The classical past was transforming the landscape. Replicas of the Parthenon nestled within a bucolic landscape, like the Chapel on North Campus, began to symbolize and define the

American university. Greek revival architecture came to be associated with the Antebellum South in contrast to the Neoclassical style of northern universities. The image of our forefathers hacking their way through the seemingly endless forest to build classical landscapes and buildings is lost to most students, faculty and visitors to American's first universities. The vision these planners had to reshape the land and build "college towns and campuses throughout the country was very much intended as an instrument through which to view, comprehend, and tame a small portion of the vast frontier of a new nation." (Kelly 3)

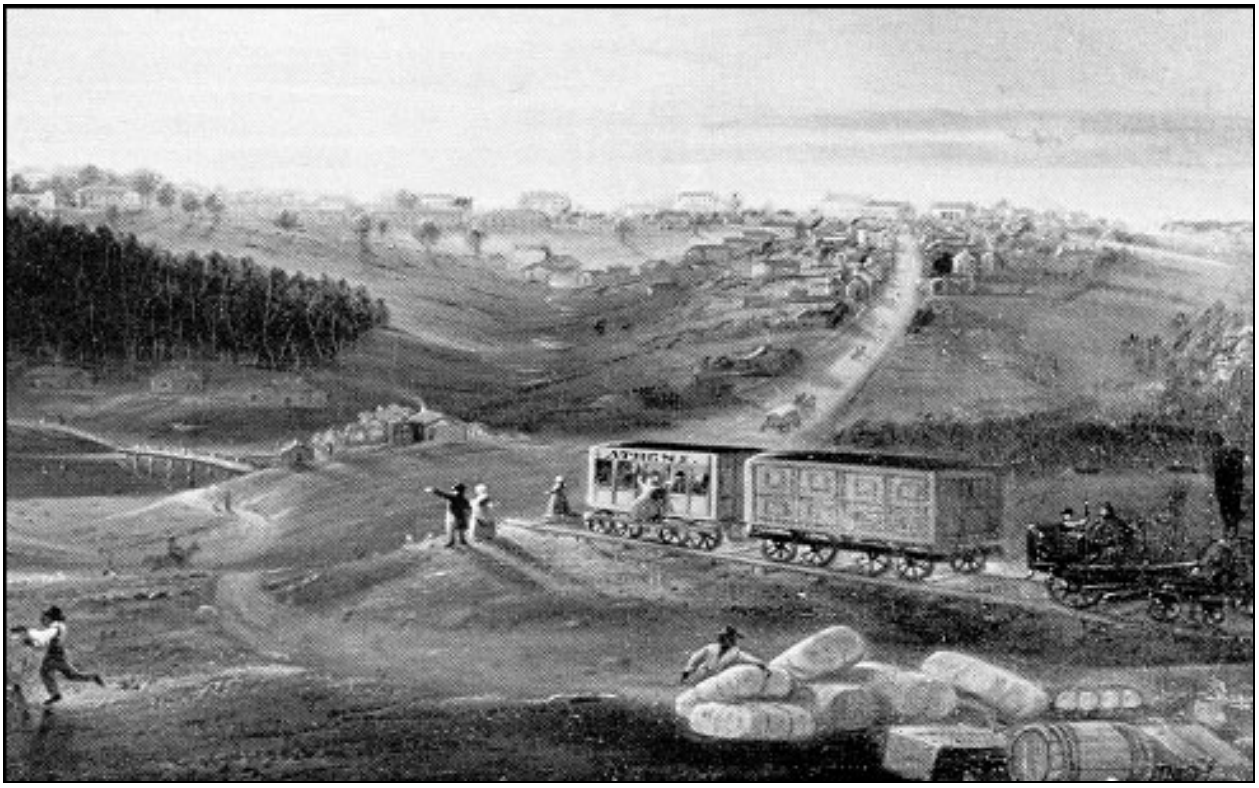


Figure 2.4: The University of Georgia from Carr's Hill 1850's

The early years at the University of Georgia were not easy by anyone's yardstick of measurement. Higher education in the colonies, as we know it today, did not start in Georgia,

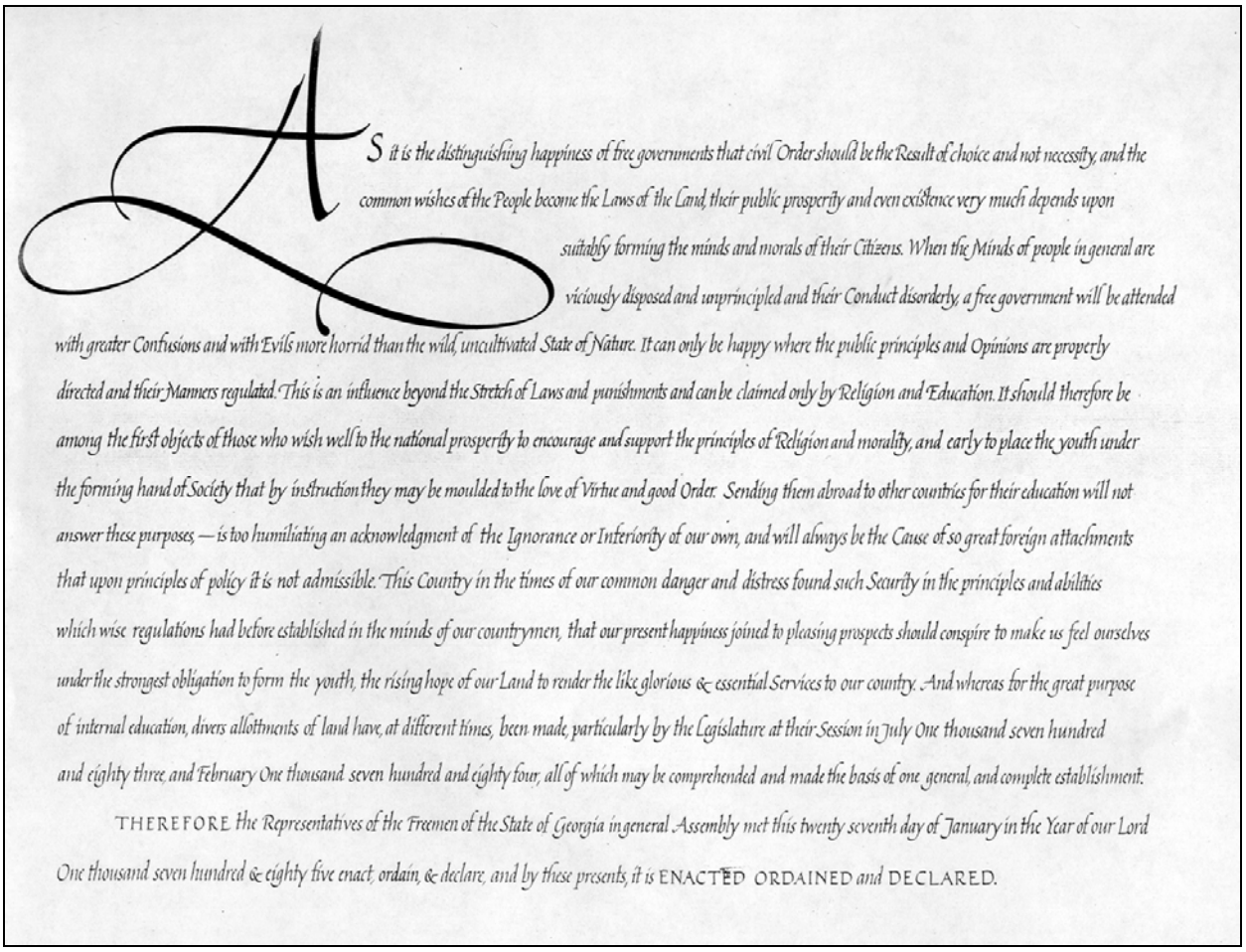
but has its roots at "Henrico College in Virginia as early as 1619." (Bowen 12, 13) This college was never built because of Indian wars. The first college established in America was Harvard College, which was founded in 1636. The goal of creating a center of learning for the new state was truly brought into focus by Abraham Baldwin beginning in 1783, and culminating on January 27, 1785 with the granting of the young nation's first land granted charter. This charter established the University of Georgia as a "capstone institution of learning with authority over elementary schools, academies, and any other state-supported educational establishment in Georgia." (Bowen 13) From 1785 until 1800, the University existed largely on paper only. Although the legislature had granted and set aside forty thousand acres for the Senatus Academicus or the governing board to determine a suitable site, the final location was not chosen until 1799. The previous site of Richland Creek Academy in the newly established town of Greensboro never created the college for which land had been set aside. In 1800 Josiah Meigs, a Yale graduate, was appointed as professor and, it was understood, successor to Abraham Baldwin, the first President of The University. Meigs had to plan a campus from scratch, build buildings to teach a yet to be found student body, and design a curriculum. He was well suited for his job, and a lesser person might have spelled a quick end for the University even before the first tree was fallen. Meigs first curriculum included studies of "Virgil, Cicero, the Greek Testament, arithmetic, bookkeeping, and elocution, two or three of the first books of Homer's Iliad, algebra, Geometry, Mensuration of Superficies and Solids, Conic Sections, Plane and Spherical Trigonometry, with their application to Navigation and Surveying, and the ascertaining of heights and distances." (Dyer 14) The first building, like most frontier colleges, was a log cabin, constructed by Daniel Easley in 1801 for the price of $187.27. (Dyer 17) By 1806, a

three-story brick building modeled after Connecacate Hall ay Yale, was erected on the campus and was named Franklin College after Benjamin Franklin. Today it is known as Old College.

Figure 2.5: Old College

Campus Development 1800 through 1866

The preamble of the University of Georgia's charter underscored its mission as an institution founded to build character and provide leaders; "public prosperity and even existence (of free government) very much depends upon suitably forming the minds and morals of their citizens." (Schulyer 59)



AS it is the distinguishing happiness of free governments that civil Order should be the Result of choice and not necessity, and the common wishes of the People become the Laws of the Land, their public prosperity and even existence very much depends upon suitably forming the minds and morals of their Citizens. When the Minds of people in general are viciously disposed and unprincipled and their Conduct disorderly, a free government will be attended with greater Confusions and with Evils more horrid than the wild, uncultivated State of Nature. It can only be happy where the public principles and Opinions are properly directed and their Manners regulated. This is an influence beyond the Stretch of Laws and punishments and can be claimed only by Religion and Education. It should therefore be among the first objects of those who wish well to the national prosperity to encourage and support the principles of Religion and morality, and early to place the youth under the forming hand of Society that by instruction they may be moulded to the love of Virtue and good Order. Sending them abroad to other countries for their education will not answer these purposes, — is too humiliating an acknowledgment of the Ignorance or Inferiority of our own, and will always be the Cause of so great foreign attachments that upon principles of policy it is not admissible. This Country in the times of our common danger and distress found such Security in the principles and abilities which wise regulations had before established in the minds of our countrymen, that our present happiness joined to pleasing prospects should conspire to make us feel ourselves under the strongest obligation to form the youth, the rising hope of our Land to render the like glorious & essential Services to our country. And whereas for the great purpose of internal education, divers allottments of land have, at different times, been made, particularly by the Legislature at their Session in July One thousand seven hundred and eighty three, and February One thousand seven hundred and eighty four, all of which may be comprehended and made the basis of one general, and complete establishment.

THEREFORE the Representatives of the Freemen of the State of Georgia in general Assembly met this twenty seventh day of January in the Year of our Lord One thousand seven hundred & eighty five enact, ordain, & declare, and by these presents, it is ENACTED ORDAINED and DECLARED.

Figure 2.6: Preamble of The University of Georgia's Charter

Old College was meant to be seen as a building in a landscape removed from the activities of the civic life of emerging Athens, in contrast to Yale's "Old Brick Row" which exists at the very edge of the town's major civic space. The parallel between Athens, Princeton, Williamsburg, and Chapel Hill might be connected in terms of the relationship of the town's edge to the university proper. At Princeton, Nassau Street serves to divide the borough into two districts, one containing the town and the other a large tract belonging to the university, while at Chapel Hill, Franklin Street performs much the same duty.

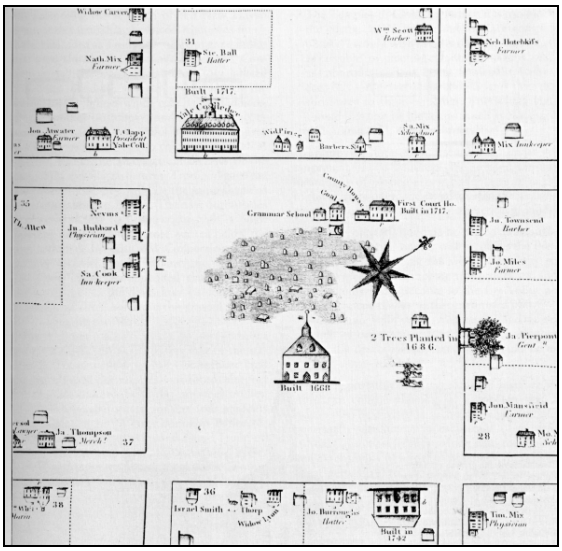


Figure 2.7: Yale University

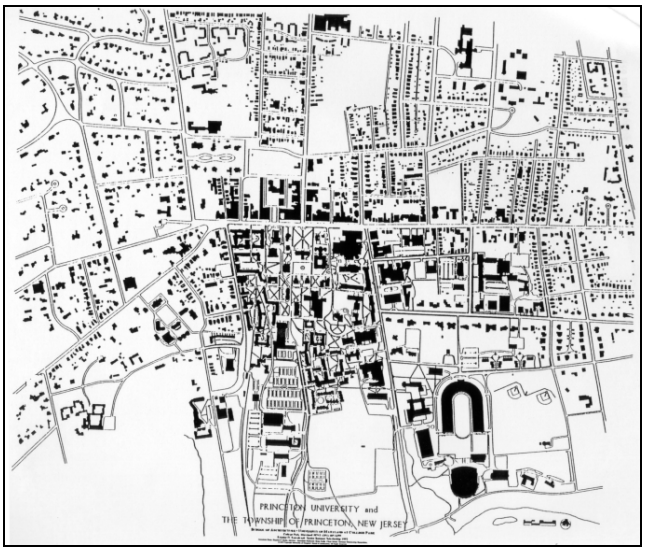


Figure 2.8: Princeton University

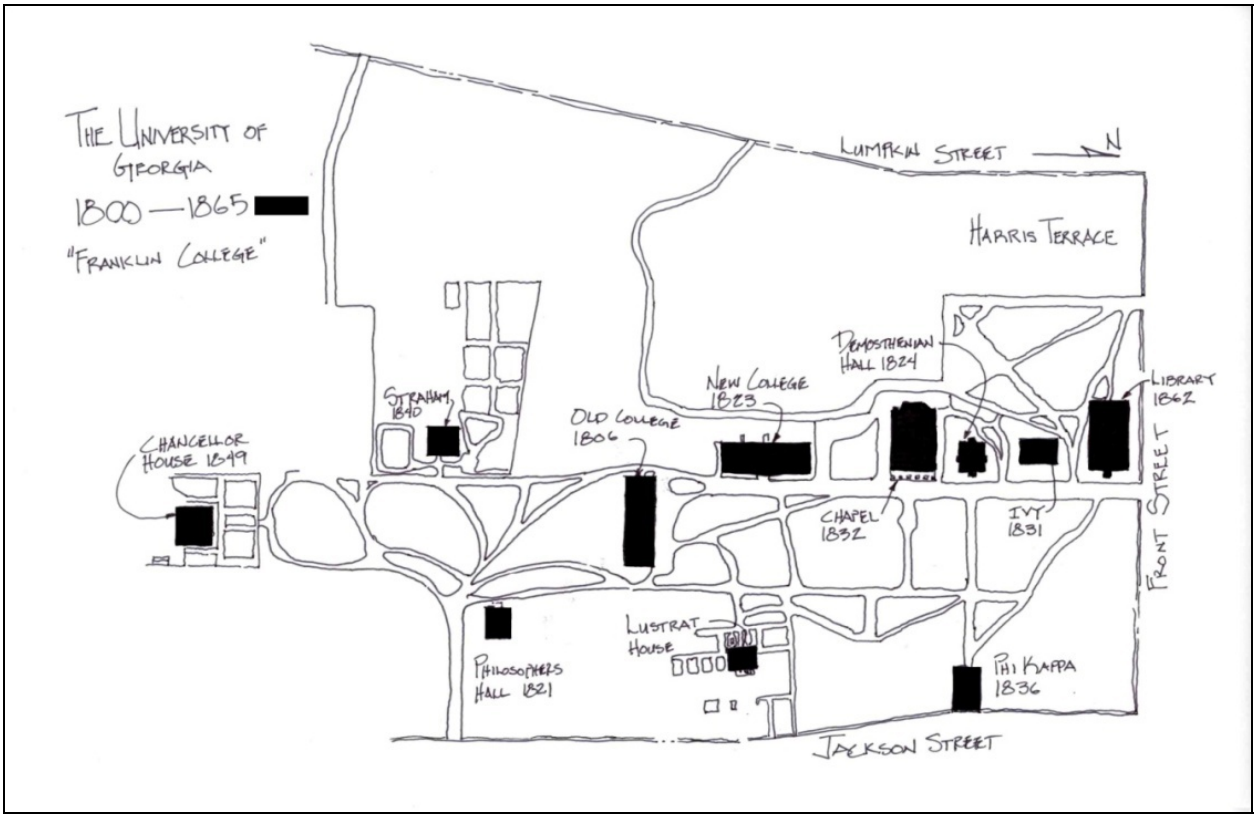


Figure 2.9: University of Georgia North Campus 1800-1865

Figure 2.10: North Campus Circa 1900 Athens Georgia

In Athens, Front Street (later Broad Street) performed the task of separating "town and gown." One side of the main thoroughfare in each of these towns would eventually be divided into individual parcels to serve as sites for homes, businesses, and other activities of the town, while the opposite side of the street would remain ostensibly one large parcel that would be conceived of as an open park, field, or campus.

Growth and development at the University of Georgia as well as with so many other fledgling universities ebbed and flowed with events within the state and nation. During its early years, the University struggled to remain financially solvent. State support was weak or nonexistent at times, and many schools like the University of Georgia sold off institutional land holdings to remain fiscally sound. In the early 1800's, most of the finances of the University were underwritten by the sale of land in Athens. The War of 1812 played a role in lowering student enrollment to a critical level. State funding for the institution also waned during the hostilities with Britain. Growth spurts happened in calmer times when institutions could focus on educating young minds. Conflicts like the War of 1812 and the Mexican American War saw

many universities all but close. Between 1812 and 1819, the University struggled to remain open. But March of 1818, the Board of Trustees commissioned a new home for the president and a brick structure, which would contain a chapel, library, and scientific equipment. A notable spike in development occurred between 1821 to 1836 when several non-wooden structures were added and enrollment swelled to over one hundred students. Many of these buildings remain today and are actively used, they are: New College, 1821, Demosthenian Hall, 1824, The Chapel, 1835 and Phi Kappa Hall, 1836. Buildings were built and razed for various reasons and needs. The president's house, circa 1818, Philosophical Hall, later renamed Waddell Hall, 1821, two wooden churches and a high school were just a few of the buildings that have not survived to present day. (Dyer) (Bowen) In 1830, fire destroyed the existing wooden chapel, and James R. Carlton and Benjamin Towns rebuilt a chapel in 1832. This classic Greek revival structure became such a landmark of the campus and surrounding community that the city's boundaries were measured from a midpoint located at the base of the chapel steps, extending in a 360-degree radius several miles away.

Figure: 2.11: 1908 Photo of the UGA Chapel

The University of Georgia nurtures a long history of maintaining beautiful campus *grounds. This started with the mere beginnings of The University. Before the University's* charter was written, Abraham Baldwin suggested, "a plat of land where agricultural experiments might be made and observations in Botany and Natural History be taken". (Dyer) This "plat of land," that was to be provided by the proposed college, did not take form until 1831 when the University's first botanical garden was sited northwest of campus. The true boundaries are not known, but it is believed to have been contained roughly in the present city block bounded by Broad Street on the south, Finley Street on the east, and Pope Street on the west and Reese Street on the north. The garden was described in the reminiscences of Samuel Boykin, a student of the University of Georgia during the years 1848 to 1851. The garden continued to serve the University and surrounding community until September 1856 when it was sold and the proceeds applied toward the costs of constructing an iron fence which included the Arch around the campus (portions of which still remain on the northernmost border of campus), and some additional ornamental trees and shrubs for the campus. Although this first garden did not survive, many other events and personalities over the years have contributed to building a history of maintaining beautiful grounds despite the often lack of funds.

Two building types that exemplify the merging of pedagogy and physical plant on early American campuses are the Chapel and the literary societies. The classical education offered at most institutions of higher-learning in the early 1800's employed memorization and recitation as a principle tool of instruction. Unlike the contemporary university, the curriculum of this time period did not engage matters of temporal or popular appeal. Learned men, it was postulated, were able to become leaders by means of a rigorous immersion in the traditional lessons of the past. Since all classical texts contained a moral lesson, it was thought that a thorough

understanding of these documents would prepare young men for their future as leaders. There was a strong religious influence on the classical curriculum of all universities at this time. Even the University of Georgia, a very public institution, had two churches (in addition to the main Chapel on North Campus) that actually existed on campus, and daily chapel sessions were required of students almost to the middle of the 20th century. (Dyer 134)

Figure 2.12: Demosthenian Hall

Figure 2.13: Phi Kappa Hall

Literary societies were extracurricular affairs, but were seen as crucial to the educated man of the day. Throughout America, young academics began to use their extracurricular time to discuss and debate the contemporary issues of their day. Literary societies and debating clubs formed in order to engage popular topics and to exercise the students' speaking skills. The University of Georgia was no exception. In 1803, the Demosthenian Literary Society was formed, and in 1824, the building, Demosthenian Hall, which stills houses the society, was erected. Following the lead of these early rhetoricians, in 1836, the ravel Phi Kappa Literary Society built a temple-like structure directly across the college yard from Demosthenian Hall forming a cross axis to the quadrangle-like green. In these buildings the students read, discussed

and debated contemporary issues of the day. Speaking skills were honed and lifelong bonds were established and reinforced. The particular arrangement of debating societies at the University of Georgia is perhaps the earliest example of a campus architecture tradition that was repeated at Princeton with the construction of Whig and Clio Halls in 1837, at Davidson College with Eumenean and Philanthropic Halls 1949, and eventually at Oxford College (originally Emory College), in Oxford, Georgia. In each case the debating society buildings were sited in direct relationship to one another about a significant campus axis. At Princeton, Whig and Clio, stand side by side as if each were metaphorically a participant in a debate facing a landscaped audience of Canon Green. (Kelly 8) At The University of Georgia, Davidson, and Oxford, these analogs for debater's face-off squarely facing each other across green fields like gladiators about to do battle. These architectural models of Greek and Roman buildings reinforced their educational functions. The locations of these building obeyed the campus hierarchy of parallel to each other and perpendicular to the dominant structure of the campus: at Georgia, Old College at the head of the green lawn quadrangle and at Princeton, Nassau Hall with Whig's and Clio Halls subordinately located north of the quadrangle. (Bowen 49) (Kelly 12) The traditions of a classical education, in each of the above campus compositions, were emphatically stated by means of a significant campus building, Nassau Hall, in the case of Princeton, or Old College, at Athens, which generated the principal axis or organizing feature of the campus. In a remarkably poetic manner, the literary societies provided these campuses with a cross-axial alignment, which might be interpreted as a counterpoint to the aloof ideals of a classical education. By mid-century the debates were so popular that they spilled over onto the campus proper in the guise of contests of physical prowess. (Bowen 49)

For over two hundred years, American higher education had developed with little substantial change in the curriculum, teaching methodology and architectural direction, but that was about to change radically. The years of studying under a renaissance type, multi-subject master, like Josiah Meigs were over, and American campuses would see rapid changes both in curriculum and architecture. Small scaled buildings, like Demosthenian Hall and the Chapel, that served one function or larger buildings, like Old College, that were combination living quarters and classrooms would give way to multi-disciplined, large-scaled buildings that housed whole departments of faculty members, like Science Hall Terrell Hall. The faculty were scholars just like their predecessors, but their expertise was narrower in focus and in much greater depth. Scholars armed with PhD's became known for their research and publishing that added to the body of knowledge in fields of specialization. Reputations of scholar and university would grow based on published work.

CHAPTER 3

CIVIL WAR TO WORLD WAR II

The Civil War's Impact on the College Campus

Enrollment, barely a hundred in 1860, at the University of Georgia declined as the Civil War erupted. In the fall of 1863, classes were canceled and The University did not re-start operations until 1866. Many schools closed down as their students were in-service to their respective causes. Buildings and grounds were used as hospitals, lodging houses and stables for both the North and South during the great conflict. As with any conflict, average people do above average deeds. Historians record these events, and in time these actions are held in hollowed reverence. As the men returned to their homes, many returned to their studies, some to start where they left off before the war, some to start fresh.

Some of the famous deeds associated with individuals soon were interwoven with the lore of the institution. Men like Medal of Honor recipient Joshua Lawrence Chamberlain, who will always be associated with Bowdoin College, where he was a student when the war started, returned to teach and become the President and is now one of their most famous alumni. After the war Robert E. Lee took a teaching position at Washington College. Lee went on to become the President (1867-1870) of the college and was finally entombed in the Chapel built in his honor. The school was later renamed Washington and Lee University. Alexander Stephens class of 1832, became Whig leader of the House of Representatives, Vice President of the Confederacy, Governor of the State of Georgia, Congressman from Georgia during the post Civil War era, and Board of Trustee member for many years at the University of Georgia. Robert

Toombs Confederate general and Secretary of State, Demosthenian member and long standing trustee, who when asked if he was going to petition Congress for pardon after the war, was heard to say, “Pardon for what? I have not pardoned you all yet!” (Boney 17) Toombs fame grew as a definer of reconstruction and a defender of the lost cause. (Boney 27) Toombs has two historical markers on North Campus, and his story is told by all student campus tour guides.

For most universities across the battle torn country restarting the education process was a slow motion event. Congress established the Morrill Land Grant College Act of 1862 for all states loyal to the Union cause. This Act provided that the Federal government could “dispose of a substantial portion of the public domain through the granting of lands to the states for the specific purpose of establishing agricultural and mechanical colleges and stimulating higher education generally.” According to the Morrill Act’s provisions, “each state could receive thirty thousand acres of land for each of its United States senators and representatives. In states where insufficient public lands existed to fulfill the law’s requirement , the government would issue land scrip. The states could then sell the scrip and thereby secure funds for the establishment of colleges….” In Georgia this amounted to a scrip of land equaling 270,000 acres. (Dyer 119, 120)

The Act represented a fundamental shift in both curriculum and building needs. The Morrill Art created funding for existing institutions or newly created agricultural colleges. No longer was higher education bound to teach the traditional classical education. A more practical and applied pedagogical system was developed. Philosophically this new approach to educating young people was one the populist could embrace and see applied. The former Confederate states were offered the benefits of the Morrill Act, but many declined for years as stubborn

defiance to their lost cause. The University of Georgia accepted the Federal help in 1872, just weeks before the deadline.

Reconstruction through the Progressive Era

Education reform came in waves during the later part of the nineteenth century. At Harvard College the radical concept of the elective system was introduced in 1869 and gained popularly among the more mature students, most of whom were Civil War veterans and wanted the freedom to chart their own studies. With the backing of prestigious Harvard, the elective curriculum concept that had been around before the civil war was now being adopted at other institutions. In 1867, at the University of Georgia, Chancellor Andrew Lipscomb moved toward his goal of a scientific curriculum and allowed an elective curriculum. (Dyer 115) Additional funding was received as a result of the Morrill Act when Georgia's land scrip was sold for $243,000 and an agricultural college was established in Athens this lead to "broadening of the curriculum to include subjects related to agricultural studies and the reception of a substantial number of new students at the Athens campus". (Dyer 120)

The Hatch Act of 1887 established funding for agricultural experiment stations through universities to rural communities. These centers were placed away from main campuses in rural areas where farmers could interact with researchers and obtain knowledge quickly and directly. This dissimulation of applied research was a tangible resource that citizens could quantify and also aided in recruiting students. Farmers for the first time had access to knowledge and techniques that yielded larger crops per acre. (Bowen 84) This also represented the first major effort to create a higher education system "to teach such branches of learning as are related to agriculture and mechanic arts…in order to promote the liberal and practical education of the

industrial class in the several pursuits and professions of life." (Dyer 119) The doors of elite universities were opening to the common man to better himself and his country.

As at many universities across the country, not everyone at the University of Georgia embraced the sweeping changes happening in higher education during the later part of the nineteenth century. Despite the optimistic outlook of most Americans, many at the University of Georgia and in the capital of Atlanta were determined to keep to the old ways. The federal filing to receive the benefits of the Morrill Act was submitted just a few months before the decade long deadline. A special session of the Board of Trustees and Governor Benjamin Conley's intervention finally won over objections to the University becoming an agricultural land grant school. Twice members of the Georgia General Assembly tried to strip the University of its public institutional status. The debate centered on religion.

Students, faculty and administrators started to take a different approach to managing the buildings and grounds under their care. The University of Georgia, like many other campuses, had a long and rich appreciation of the land. In 1881, Chancellor Mell called on the services of the famous landscape designer P.J. Berckman, designer of the Augusta National Golf Course, to develop a master plan for the north campus grounds. Berckman worked at no expense to the University and donated trees and shrubs for the effort of beautification of the campus. Around 1891, the Ladies Garden Club of Athens founded the first garden club in the United States, twelve Athens women whose legacy is still present on campus today. (Dyer 120, 122)

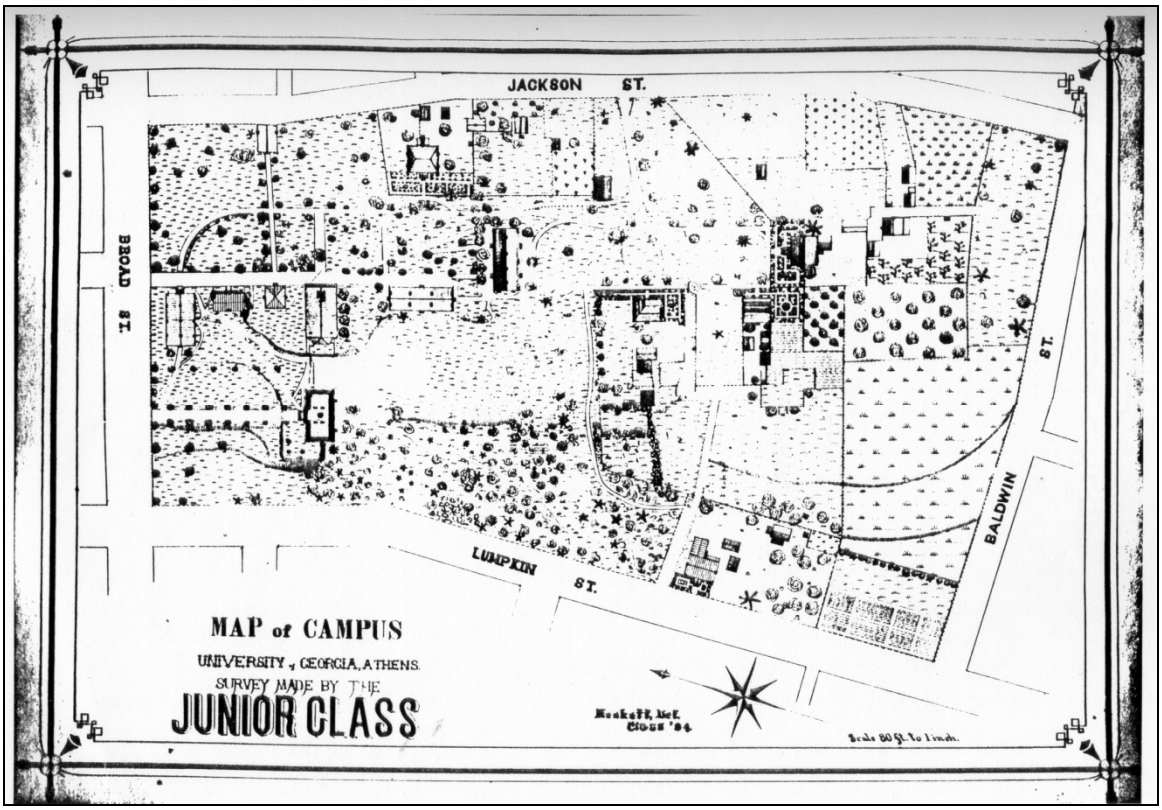


Figure 3.1: Plan of UGA in 1899

Along with the growing awareness that designed landscape spaces added aesthetic value, it was believed at the time that skilled designers could help solve urban and social problems that were festering in cities of the late nineteenth century. The redesign of Paris (1853-1870) by Napoleon III and his city planner, Baron Georges Haussmann, was touted as proof that large scale city planning could work. Paris transformed itself from an overgrown medieval city to a modern capital. Designers started contemplating broader themes in their planning approach. Whole cities could be designed or redesigned. At the World's Columbian Exposition of 1893 in Chicago, the City Beautiful Movement sprang to life. Daniel Hudson Burnham, the director of the exposition, has been called the indisputable "Father of the City Beautiful Movement." (Encyclopedia of Chicago 61) Designers coupled the dramatic changes brought about by the

industrial age to urban living, where people would live and work in planned cities. City Beautiful was directly linked to Progressivism. Civic leaders placed their belief on creating beautiful cities, which in turn would inspire its citizens to higher moral and civic virtue. Designers imaginations were fueled by beaux-arts composition with strong axial arrangements culminating in grand buildings flanked by gardens and wide vistas. These grand buildings were usually civic buildings like city halls, civic centers or museums. The supporting buildings along these avenues were lesser in scale but no less humble style. Many of the grand avenues of today's American cities were created during this phase of American history. The country as a whole was becoming aware of the growing heritage in its built environment. Designers like Frederick Law Olmsted, John Wellborn Root, Louis Sullivan, the architectural firm of McKim, Mead and White's designs for Columbia University, Cram Goodhue Ferguson's plan for the William Rice Institute (later Rice University), and Cass Gilbert's University of Minnesota led the City Beautiful Movement.

The college campus was also influenced and transformed by the City Beautiful Movement. During this period in American history, new campuses were opening their doors at a fast rate to accommodate the large influx of college age students. A trend at universities was holding design competitions. The selected winners would be commissioned to oversee the design and construction of the new campus. Carnegie Mellon University and The University of California at Berkeley were two noted campuses on which trustees held open national design competitions for their new campuses. Both designs drew heavily on the Beaux-arts style and the City Beautiful Movement for the final solution. At the University of Georgia, Chancellor Walter B. Hill was appointed in 1899, and he began an era of progressive change. He courted New York philanthropist Georgia Foster Peabody, a native of Georgia, who became the first

significant private donor by gifting $50,000. Hill used part of this gift to build a library and hired New York landscape architect Charles Wellford Leavitt to create a master plan for the future of the University.

The Leavitt Plan

Charles Wellford Leavitt (1871-1928) was educated in Connecticut and Pennsylvania as a civil engineer but quickly started practicing landscape architecture and opened his office in New York in 1897. Many of Leavitt's commissions were country estates located in New York and California. His most notable commissions were the gardens for the Walter P. Chrysler Estate, in King's Point, and the formal gardens for the Lillian Sefton Dodge Estate in Mill Neck, New York. Leavitt also executed some important civic commissions, most notably, improvements to the Gate of Heaven Cemetery in Mt. Pleasant, New York and the Lake Mirror in Promenade, Lakeland, Florida. Leavitt's career was unexpectedly cut short when he contracted pneumonia and died in 1928. (MacKay 252, 253)

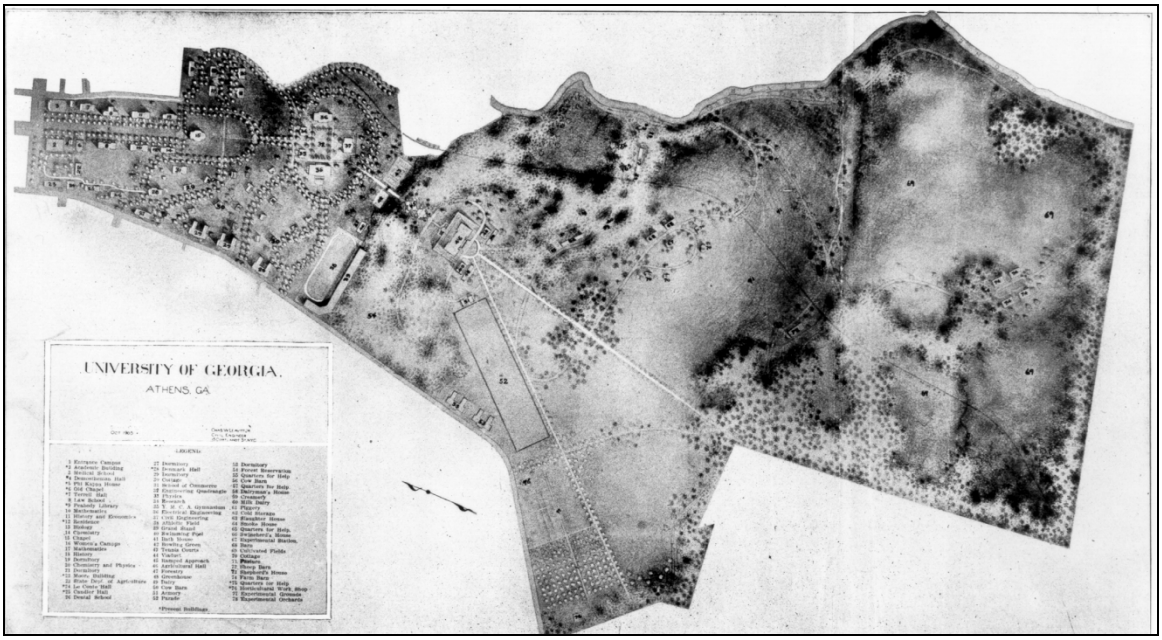


Figure 3.2: 1905 Leavitt Plan

Leavitt's plan for the University of Georgia was unveiled in January 1906. The Beaux-arts composition featured a strong axial arrangement highlighted by a centrally planned domed chapel building. The Leavitt plan divided the campus in to five sectors: the Academic Group, the State Department Group, the Engineering Group, the College for Women, and the Agricultural Group. (Bowen 111) Leavitt proposed that Old College be razed and the quadrangle space be extended in a southerly direction. The chapel was proposed as a terminal feature of the new quadrangle's main axis. Leavitt drew upon the mythology of Athens, when he configured the Engineering Group. He had intended that the buildings in this group were "to be modeled after the Acropolis," in Athens, Greece. (Bowen 117) Leavitt's plan also solidified the location of the Agricultural School. He proposed that new buildings be built on a prominent site overlooking Athens to the north. The plan incorporated the acquisition of additional lands, which expanded the size of the campus and insured the Agricultural School's relationship to the University. The Lumpkin land, 208 acres, was acquired in 1908. (Boney 102)

Leavitt's plan made use of the natural features of the land that characterized the Athens area. His Beaux-arts plan embraced the deep ravines and steep hillsides that had previously separated portions of the campus and were surely seen as impediments to growth by many past administrators. Leavitt proposed Tanyard Creek be bridged with a "pedestrian aqueduct". (Bowen 207) Leavitt also used the Tanyard Branch ravine as a site for the relocation of athletic fields. The natural contour and bowl shape of the ravine were eventually formalized with the construction of Sanford Stadium in 1929. Although many aspects of Leavitt's plan were followed, other recommendations, such as the demolition of Old College and the creation of a monumental quadrangle remained only on paper. Leavitt's plan remained the most significant formal plan in the University of Georgia's history until the 1999 Master Plan.

Leavitt conceived a grand physical plan that shared as large a plan as Chancellor Hill's embodiment of the institution's ideals and aspirations. As The University continued to grow under the influence of Leavitt's skillfully executed plan, The University was nurturing its own skills of landscape design. A young program was born under the direction of one of the University's own. In 1928, Hubert B. Owens became the Director of the newly formed undergraduate program in Landscape Architecture. Owens was a landscape architect, and the new program was part of the College of Agriculture in the Horticulture Department. (Bowen 252)

The art of landscape in America became even more absorbed with the principles of classicism. While the intentions of the first generation of settlers in the new nation may have been survival — to beat back the wilderness and to establish towns on the frontier — subsequent generations began to appreciate the need for refining a vision of an American landscape. The reason lay deeper than merely making campuses appear pretty. At the very crux of the American campus tradition, prior to the Second World War, was the notion that the physical form of an institution in some way offered an embodiment of the intellectual community's ideals and aspirations. Thomas Jefferson's design for the University of Virginia is probably one of the most important illustrations of this idea. To paraphrase Jefferson: "There is reciprocity between the learning and the physical environment". (Dennis 2)

The Depression Years through Modernism

Hubert B. Owens continued to be a great influence through the landscape designs he created for The University of Georgia campus. One of his most important contributions was the design of the Founder's Memorial Garden. The garden began development in 1941 to commemorate the twelve women responsible for starting the first Garden Club. The garden and

the Greek revival house it surrounded became the headquarters of the Garden Club of Georgia in 1963. Another Owens design to have a large effect on campus was his early 1950's planting design around the Agricultural Extension Building. This project spurred occupants of other buildings on campus to become interested in the beautification of areas immediately around their buildings.

Figure 3.3: 1939 Aerial Photo South Campus

When Governor Richard B. Russell signed the Reorganization Act of 1931, the state government was significantly streamlined. (Dyer 186) Paralleling the reorganization of the State Government, the new Board of Regents struggled with the idea of consolidating the state university system or dividing it into a series of smaller autonomous institutions. In 1932, the three major schools occupying the Athens campus were the state university, the state agricultural college and the state normal (or teachers) school. Following a prolonged debate the schools were

officially reorganized into a consolidated University of Georgia with Steadman V. Sanford appointed its first president.

Despite a period of economic distress, enrollment at the university was on the rise. Owing to a scarcity of employment opportunities, enrollment at the university increased from 1,855 students in 1932, to 2,903, in 1936. Within that time frame, from 1933-1934, the University system's budget decreased by 21 percent. (Bowen 236) Following a trend found at many of the nation's state supported institutions of higher learning, The University of Georgia applied for Works Progress Administration (WPA) and Public Work Administration (PWA) funding. During the Great Depression an additional seventeen buildings were added to the 1934 inventory of thirty-four buildings. Many campus improvements, such as landscaping and the paving of sidewalks and roads were directly the result of New Deal programs. Many of the buildings built during the 1930's and 1940's were executed according to the designs of Robert H. Driftmier, a professor of agricultural engineering, and his architect Roy Hitchcock. Driftmier and Hitchcock's buildings constitute one of the first departures from the Leavitt plan. Although the buildings were built in a derivative of the Neo-Classical style, the setting of the structures did not serve to reinforce Leavitt's intentions. "Driftmier and Hitchcock scattered the new buildings around the entire campus in what appears to be an irregular pattern or plan." (Bowen 244) One of the first buildings built by Driftmier and Hitchcock was Clark Howell Hall 1937, a PWA project. PWA financing also permitted the renovation of both Moore and New College.

While New Deal projects fostered improvements to the campus, the University briefly lost its accreditation due to political infighting between Governor Eugene Talmadge and the Board of Regents. Recovering its academic reputation dominated all aspects of University life during the early 1940's. Following the election of Ellis Arnall to the gubernatorial seat in 1943,

the University's accreditation was restored. World War II caused business as usual to grind to a halt. The campus was designated as one of four Naval preflight training schools in 1942. Requiring larger gymnasium and pool facilities, the Navy built a new structure in Tanyard Branch west of Sanford Stadium. South campus also became the site for additional housing to fulfill the Navy's needs. The undated Blue Key map drawn at the beginning of the Second World War illustrates the extent of facilities following the building boom of the New Deal. By 1947, the Plant Operations Map, drawn by Edwin P. Kenny, illustrates the extent of growth that incurred during wartime including nearly 200 units of temporary housing erected to accommodate the naval aviators. (Kelly 18)

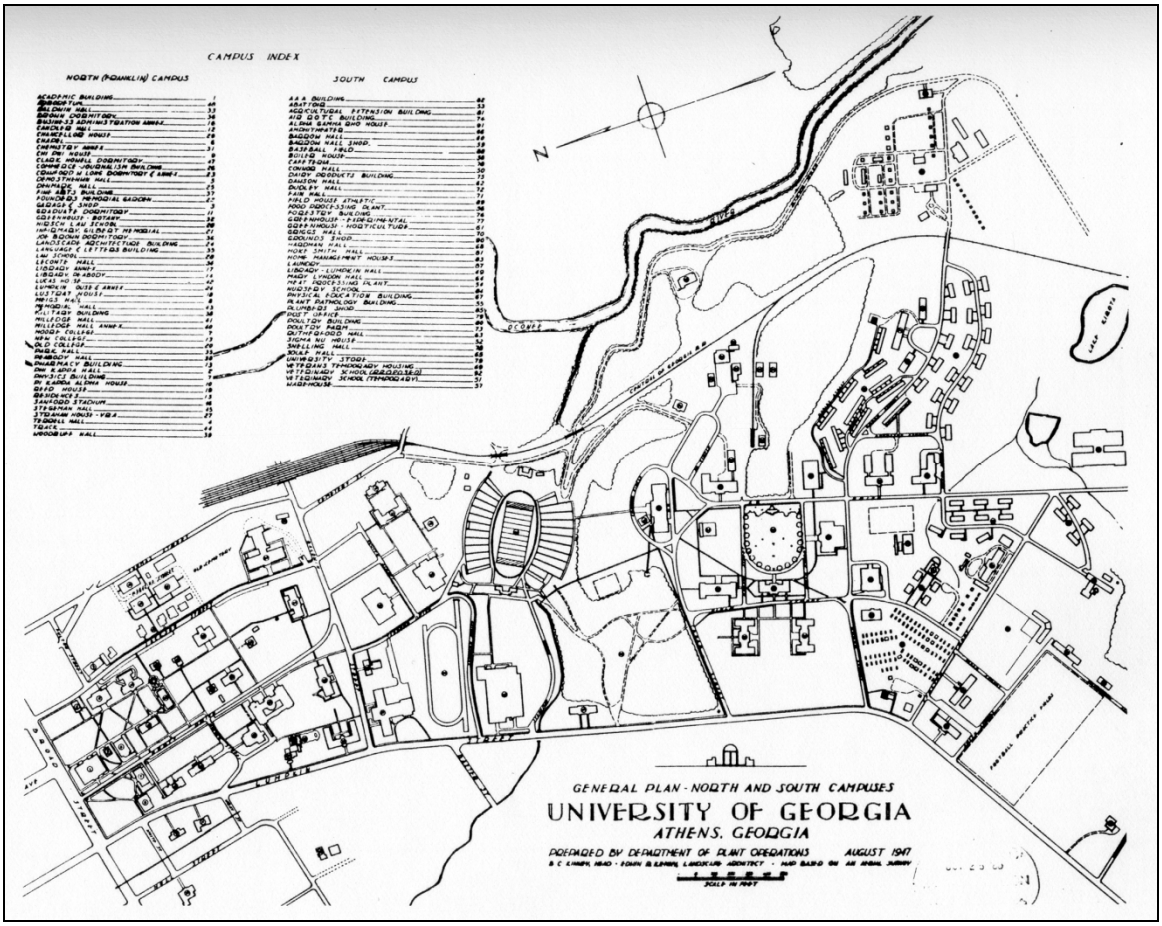


Figure 3.4: 1947 Map of Campus

From the Civil War through 1945, college campuses saw an incredible amount of social and technological changes that effected the landscape of the American college, such as the industrial revolution, the City Beautiful Movement, the introduction of female students to campus, intercollegiate sports, and concepts like society's responsibility to the lower class that developed in large numbers around the turn of the twentieth century. Additionally, new colleges developed around specific themes of study like Agricultural and Mechanical Arts colleges, such as Texas A & M and Florida A & M, and Technical colleges, such as Georgia Institute of Technology and Carnegie Mellon. Still others developed for different reasons like traditional black colleges, religious colleges, or military colleges that stressed rigorous discipline coupled with a stern academic focus. Whatever the ideology or social direction in which colleges grew, the growth often reflected the changes in our evolving country. The buildings and grounds also were also changed with larger and more diverse buildings that often reflected the architectural style of the day. Collegial Gothic became emblematic of higher educational architecture from the 1880's through the 1930's. Colleges were not limited to one style of architecture; Neo-Classic (1850's - today), Arts and Crafts (1890's - 1920's), Art Deco (1920's - 1940's), the City Beautiful (1890's - 1930's) aesthetic, and other indigenous styles contributed to the varied pallet of buildings that made up the American campus during this period. There are some notable exceptions to the multi-styled campuses. Duke University in North Carolina constructed Collegial Gothic from the beginnings of its founding and with few exceptions, continue to build in that style today. Another example would be the University of Colorado at Boulder where the architect, Charles Z. Klauder, developed an Italian hill town motif, which has come to represent the school. In most cases, campus architecture exhibits several styles depending on the era in which the buildings were designed and constructed.

CHAPTER 4

WORLD WAR II TO 1990

The War Ends – The Veterans Come Home

College campus development during the post World War II era until the close of the twentieth century was marked by wild spurts of growth starting with the 1944 Servicemen's Readjustment Act, more commonly known as the GI Bill. (U.S. Department of Veterans Affairs) Some historians have said the GI Bill was an attempt by the government to avoid another depression or make up for the inadequate train ticket home and the $60 paid to World War I veterans. Whatever the reason, the fact remains that the hallowed halls of higher education were opened to millions of veterans to pursue college degrees. This influx of students forever changed the face of higher education. By 1947, veterans represented forty-nine percent of college admissions, and by 1956, 5.7 million of the 16 million World War II veterans had participated in an education program. (U.S. Department of Veterans Affairs)

Shortly after World War II, building activities again dwindled despite a shortage of housing and the need for a new library building. Paralleling legislation that was occurring in Congress to create the GI Bill, the Georgia Legislature approved the creation of the University System Building Authority in 1949 and gave it the power to finance campus projects. As soon as the powers of the Building Authority were confirmed in court, the University broke ground for new housing. Driftmier and Hitchcock designed the first housing buildings and Myers Hall was completed in 1952. Construction of housing units continued and the "building boom" was chronicled in a film produced in 1956 by the University of Georgia to celebrate the

sesquicentennial anniversary of the first graduating class. Ironically, when the University found its funding for a new library building, in part due to the philanthropy of Mrs. Ilah Dunlap Little and in part due to state funding, the site selected for the structure was the site of the chapel in the Leavitt plan. (Boney 164) The location of a library at this critical site reinforced the Leavitt's Beaux-arts plan and symbolically suggested a campus order that was more in tune with the iconography appropriate to a state institution. Jefferson's 1824 University of Virginia iconic temple of learning, which is the Rotunda, may have influenced campus leaders in Georgia.

The 1953 Master Plan

In 1953, the University System Building Authority mandated campuses to commission long-range master plans that would anticipate and govern campus growth for a period of ten years. The Atlanta firm of Aeck and Associates was engaged to provide a plan for the Athens campus. "The Aeck plan physically represented the direction that state and local officials wanted to grow." (Bowen 268) It also represented a total departure from the planning techniques that had been employed by architects and landscape architects working on the campus since the Leavitt plan. Additionally, the types of buildings represented in the plan represented a departure in character and concept from the types of buildings that had been built on the campus during the preceding 150 or so years. The Aeck and Associates plan was inspired by European modernism, the architecture and urbanism of Le Corbusier, Mies van der Rohe, and Walter Gropius. The buildings illustrated in the plan, a fine arts center on north campus, a modern science center complex, and a new administration building, were conceived of as mega-structures, on a scale which dwarfed the original campus buildings. Unlike the earlier arrangement of buildings of the campus of the University of Georgia, the buildings proposed by Aeck and Associates did not give form to the exterior landscape spaces. Rather, the spatial continuum of the campus

landscape would be interrupted by a picturesque composition of volumes and abstract planar surfaces, the result of the internal disposition of functional proximities. A significant modern landscape design during this period was Thomas Church's 1955 design for the Georgia Center for Continuing Education. (Kelly 24)

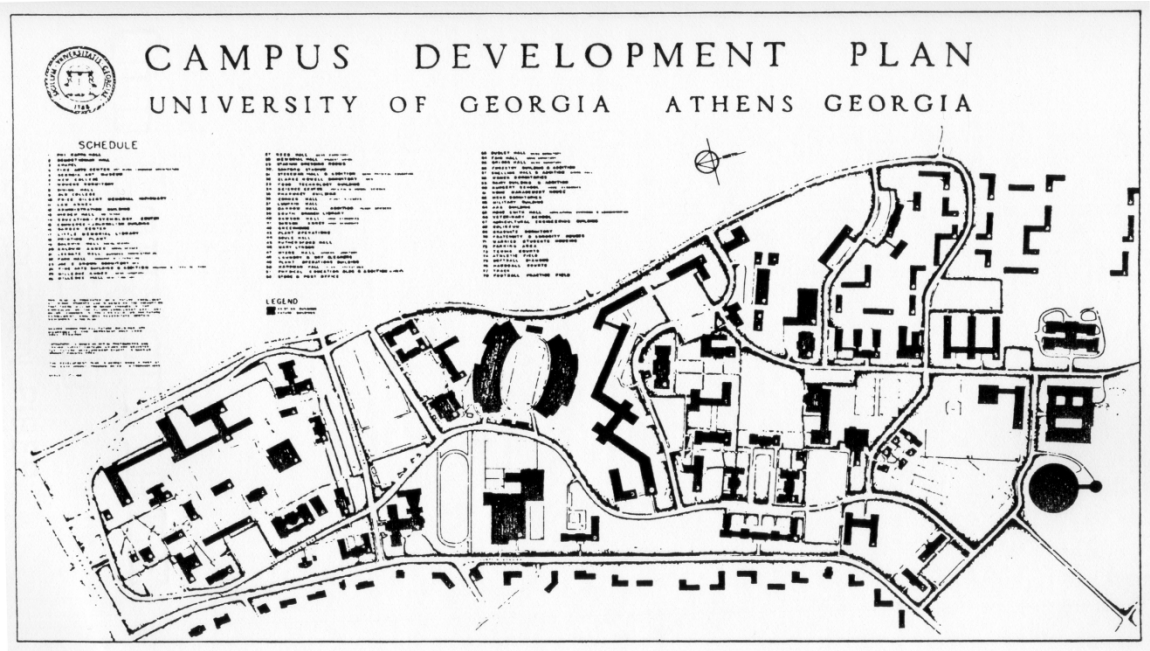


Figure 4.1: The 1953 Master Plan

A very significant pedagogical decision was made by the administration during the 1950's. The University requested six million dollars from the legislators to build six buildings dedicated to six different branches of science: the Physics Building, 1959, the Chemistry Building, 1960, the Geography/Geology Building, 1960, the Biological Sciences Building, 1960, the Poultry Science Building, 1960 and the Food Science Building, 1959. This core science corridor of buildings would forever change the image of the University of Georgia from the

Franklin College of Liberal Arts to a research University that would obtain a national academic reputation in the sciences.

The 1967 Master Plan

The 1953 Aeck plan governed the growth of the campus starting in 1953 and ending in 1967 when Aeck and Associates were retained again to update the campus master plan. In the 1960s, campuses were feeling pressures of increased growth and increased demands from students that Leavitt could have never imaged. Along with the sprawl of the American city, universities were sprawling. Trees were cut down, hills were flattened and parking lots were added. A few years later the parking lots were replaced by buildings and the cycle started all over again. Under this pressure, Aeck's 1967 plan called for an innovative solution that proposed a campus-wide rapid transit system. The Aeck team realized that new roads and parking facilities could only partially deal with the traffic problems on the campus. In order to connect various disparate portions of an ever-expanding campus, a "people-mover" type system was planned. (Bowen 282) Like Disney World, the rubber-wheeled computer-controlled vehicles moved along a track that at times was elevated and would have permitted pedestrians to traverse the campus without impacting local traffic. The system received considerable attention, but at the last minute the University administration and the Board of Regents decided to decline the Federal Transportation grant and the people mover was installed at the University of West Virginia. (Bowen 284, 285)

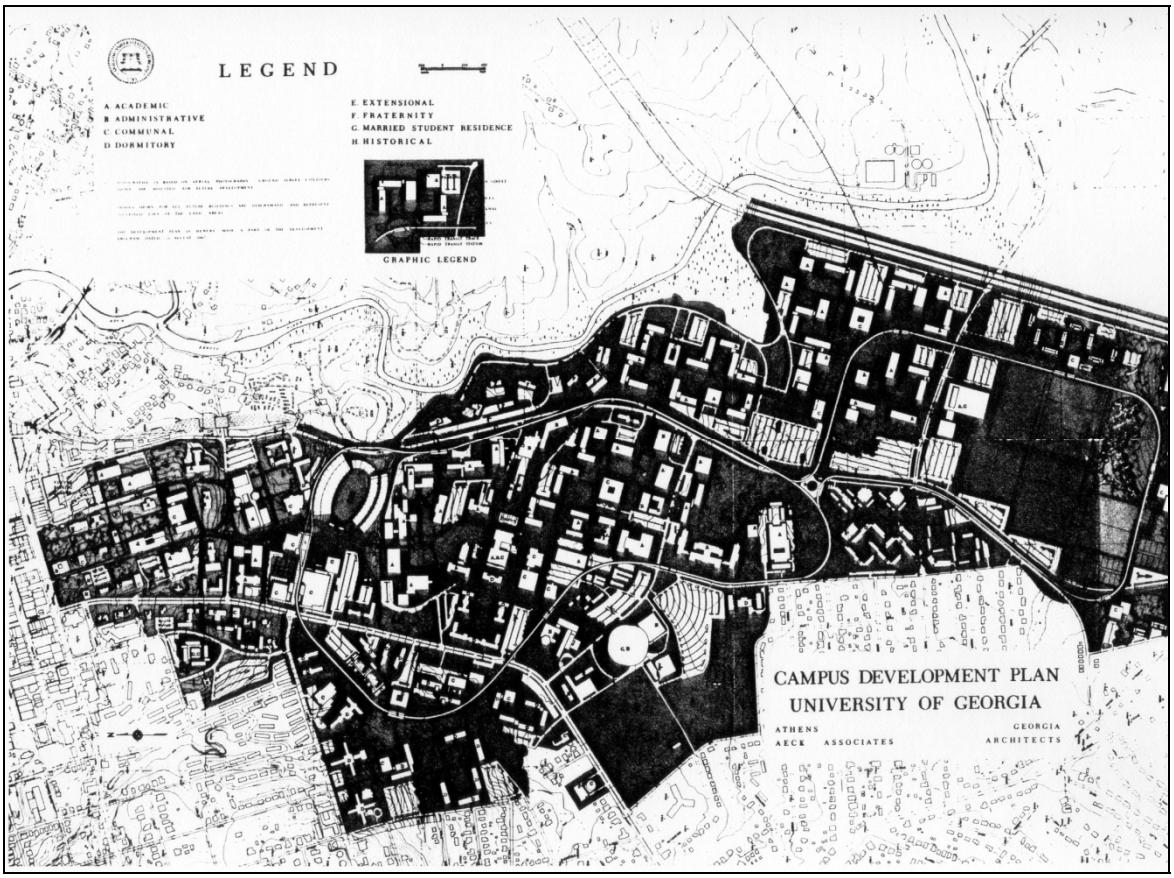


Figure 4.2: 1967 Master Plan- Aeck Associates

During the period from 1967 to 1980, the campus again expanded with the construction of a 259,500 square foot Coliseum, along with numerous laboratory and classroom buildings. High-rise dormitories were introduced onto the Athens campus as early as 1961, and the demeanor of the once quaint campus began to resemble that of a small city. During this period "functionalism" and "flexibility" were the watchwords of campus planners. Tradition had been discarded in favor of a "progressive" planning agenda. The 1967 plan was never amended after the monorail idea was abandoned. Buildings that were designated to accept and accommodate the large amount of people exiting the people mover no longer worked in the location of Aeck's plan. The 1967 plan was nullified with the decision not to revise the master plan. One outcome

of the 1967 planning effort was the hiring of the first registered architect to bolster the Campus Planning Office. David Lundy was an employee of Aeck and Associates and worked on the 1967 plan. (Kelly 22, 23) He would oversee campus construction until his retirement in 1996, when Daniel Sniff took over as Director and Campus Architect.

Landscape Leadership at The University of Georgia

Paralleling the building growth, the Grounds Department was providing landscape designs to fill the spaces on campus. Many people have left their mark in the history of University of Georgia landscape, one of whom was Brooks Whigington of the University's Grounds Department, whose influence spanned from 1940's to 1960. In the 1960's, Duncan Callicut became the University's first landscape architect and deserves much of the credit for campus beautification. He is responsible for extensive tree planting on campus, with the oaks lining Lumpkin as an example. John Dunnington followed Callicut, and from 1975 through 1985, Gordon Chapel carried on tradition as the next UGA landscape architect. There have also been some landscape designs by private firms, one of which is Robinson Fisher's 1989 design for the Mary Kahrs Garden west of the Ecology Building. For the most part, in-house design efforts have resulted in one of America's finest landscaped campuses.

Since 1985, The University of Georgia's current landscape architects, under the leadership of Paul Dexter Adams, have stepped up to continue the legacy and have succeeded in bringing the standard of landscaping at The University to an unmatched high. The University of Georgia is known for the beauty of its landscape. This tradition has only strengthened over the years and will continue to under the supervision of such quality leadership. (Bowen 289)

Social Pressures on College Campuses

Colleges struggled under the pressure to continue building to keep pace with the growing numbers of college students. The benefits of a college education went from one of pre-World War II privilege status to an accepted part of the educational matriculation process for most Americans. Campuses also became a focal point of American's social conscience during the civil rights movement, integration, the Vietnam conflict, and the era of free love, drugs and non-conformity. Campuses were thrust onto center stage as never before in the history of higher education. During the 1960's and 1970's, higher education came to represent to many Americans a liberal fortress of wayward unruly teenagers. Historians might also represent this era as one of social liberation or a time when ideas and thoughts were stretched beyond the cultural norms. If this general perception of attitudes is true, then a similar observation can be leveled against campus planners of the time. As illustrated in the University of Georgia Master Plans of 1953 and 1967, the effort put into planning was shortly abandoned by the administration of the time. Additionally, many of the concepts, if implemented, would have destroyed much of the historical fabric of the campus. That is not to say that the lack of a plan was beneficial. In the vacuum of a master plan, buildings were built without consideration how adjacency could strengthen one another or support a strategic and academic direction of the institution. The lack of a cohesive aesthetic direction, building placement, working in harmony with a landscape plan and an almost lack of respect for the environment all exacerbated a haphazard planning mentality that was the rule on most college campuses of the post World War II era.

The international style grew into the Modern Movement that all but rejected traditional planning principals. Modern architects ignored the lessons laid down by their grandfather architects - Thomas Jefferson and Benjamin Latrobe, University of Virginia; Roberts Mills,

University of South Carolina; the Olmsted's, University of California Berkley, and hundreds more. Embolden by modern architecture's mass appeal, architects designed campus buildings that void thousands of years of basic architectural rules. First and foremost is the space between the buildings that frames the space. "A good campus consists of a group of harmonious buildings related by various means (such as arches and landscaping) that create well-proportioned diverse urban spaces containing appropriate furnishings-benches, pools, fountains, gazebos and walkways." (Gaines 1, 2) The Modern Movement's philosophy of individual, stand-alone, designed as a object of art went against years of campus planning principles. Modern materials, like glass curtain walls, minimal detailing, stark smooth finished concrete painted white, aluminum storefronts, doors and flat roofs, typified Modern buildings that were juxtaposed with their nineteenth century counterpart buildings. Buildings intentionally were sited in formal green spaces that blocked views, obstructed Beaux Arts axial lines of sight, blocked pedestrian paths or made students walk under a spanned path, and generally tried to break the established paradigm. That's not to say all modern buildings were bad. Some of the finest works of Modern architecture are present on college campuses. Because the Modern Movement coincided with the largest building boom in college history, there are numerous of examples of poor Modernism. Often times the criticism of Modernism stems more from poorly executed examples of modern buildings where the individual architect did not adhere to good planning principles. The best examples of Modern architecture on college campuses were designed by architects who understood both the Modern philosophy of design and the sensitivity of the campus landscape.

Buildings of this era reflected the increase in student population in scale as well. Fifty years earlier, a very large building on a college campus would have been fifty thousand square

feet. The six buildings built for the sciences at the University of Georgia in the early 1960s totaled over one million square feet. (UGA 93)

Challenges of the Next Generation

From its beginnings in 1785 with little more than a few trustees, a president, a charter and some land, to the present day campus covering over 600 acres of land and accommodating over 32,500 students, the University of Georgia has been transformed well beyond its founders' expectations. Visitors to the Athens campus can still see classes held beneath broad canopies of campus trees in much the same manner that Plato conversed with his pupils on the outskirts of another Athens, in the groves of Academe, over two thousand years ago. The original log building is long gone, and Old College remains as a witness to the campus' past; however the University of Georgia of today has grown into a complex and energetic city of scholars.

The challenge for the next generation of campus designers is how to correct nearly four decades of campus architecture and landscape design that failed to understand the physical environment of the institution as connected to the pedagogical mission of the university. Critical to this is a return to an understanding of the land and the symbolic potential of landscape. At the beginning of the 21st century, we are becoming ever more aware of both the practical and moral imperative concerning sustainable design. Land and resources are even scarcer in the modern university. Ironically, the university community finds itself back in the leadership game — what is a vision for a sustainable development of the future?

CHAPTER 5

DEVELOPMENT OF THE UNIVERSITY OF GEORGIA 1997 MASTER PLAN

A Process of Success

Great ideas on college campuses have failed because campuses, by their very nature, are diverse with opinions. In order for broad ideas to be implemented, this same diverse university community must accept, embrace and take ownership of the initiative. A long establish process on college campuses is a thorough vetting by committee. By studying the master planning process of 1996 through 1999, one can understand the committee structure and see a successful outcome.

At its July 9, 1996 meeting, the Board of Regents of the University System of Georgia adopted the *University System of Georgia Comprehensive Plan 1996-1997*. The Regents' purpose for passing a master planning policy that mandated all university campuses within the system to complete a master plan was two-fold. First, to foster the development of a physical plant that is efficient in serving the academic mission and its physical operations and secondly, to create a physical environment that is beautiful, emblematic of its educational purpose, and encourages social and intellectual interchange among students, faculty and staff.

In February 1997, in accordance with the Regents' mandate, the University of Georgia hired the architectural firm of Ayers Saint Gross to guide the master planning process. Ayers Saint Gross inherited the framework of a master plan already underway with in-house staff. The in-house effort was lead by architects Daniel Sniff and Scott Burush working in the office of Campus Planning. Additionally, the University had adopted a planning policy titled *University of Georgia Campus Master Development Plan Planning Policy Manual* completed March 15,

1995. This document was a compilation of policies that were envisioned to guide architectural consultants and administrators in all planning matters on the campus. This document was also an attempt to bridge the gap between the failed 1967 master plan and the haphazard physical growth that had occurred in the years between 1967 and 1995. The *University of Georgia Campus Master Development Plan Planning Policy Manual* was adopted by the University but was never implemented, because it was superceded by the *University System of Georgia Board of Regents Physical Master Planning Template* accepted July 1996. Although there were many flaws with the *University of Georgia Campus Master Development Plan Planning Policy Manual*, most notably the lack of any drawings, no analysis of deficiencies, no ties back to an academic plan, and no overarching university strategic goals, it was nevertheless recognition on the University's behalf that it desperately needed a structured physical master plan.

The master plan team lead by Ayers Saint Gross had its work cut out from the beginning. The University of Georgia had a legacy of commissioning a master plan but not adhering to it after it was approved. The only master plan that was executed to any real extent was the 1906 master plan. The 1953 plan was abandoned shortly after the sciences complex funding was approved by the general assembly in 1956, and the 1967 plan was made null once the President of the University and the Board of Regents dropped the monorail, which the plan was designed around, in 1968. The University took a chance in the selection of Ayers Saint Gross over more experienced and notable firms such as Sasaki Associates, MHTN Associates and Ellerbe Becket. The relatively small firm of Ayers Saint Gross had only been in the higher education master-planning arena for a few years and had never been selected for a commission at a campus as large and diverse as the University of Georgia. The team quickly started to assimilate background information that included the history of the physical development of the campus, an

existing conditions assessment, building use, existing infrastructure, open space, vehicular circulation, environmental issues and topology. Through the systematic analysis of this data the design team could understand, in part, how the campus developed. Sometimes the team found clues that provided insight into past administrative decisions affecting the way campus had developed, and sometimes the analysis could not answer these questions. These building blocks of information would provide a rational foundation for the different design vignettes or options that would be vetted through the campus community in public forums. The information and feed back from these meetings would lead to suggestions and recommendations that would be presented to the executive level of the University's administration.

From the beginning, the team found that the lack of master planning for almost one hundred years created many challenges, the first being skepticism in master planning and planning in general. The fact that the 1953 and the 1967 master plan had been completed, but forsaken so shortly after approval only added to the environment of doubters in the senior administration, many of whom still remembered the 1967 plan and its abandonment. Added to problems faced by the planning team was the fact that the University had no academic or strategic plan on which to base design decisions. Early on, it became clear that the selection committee had made a wise choice in the relatively untested Ayers Saint Gross (ASG) team. The selection committee decision was based on ASG's approach to master planning as a totally inclusionary process. ASG stated that the master plan is not theirs but the University of Georgia's, and the final decisions must be made and owned by the University to be truly effective. The enthusiasm Adam Gross, the principal in charge of the project, gave the team provided comfort to the few supporters of the planning effort, because the majority believed the master plan would never be implemented.

In the spring of 1997, the first formal meeting was convened with the master planning committee. A tiered system was developed, consisting of an administrative team that included Vice Presidents and Deans, a design and operations team that included city of Athens and student representatives, and a steering committee that included the President and many of his Vice Presidents, who made final decisions. The Director of The University Architects directed and coordinated all activities of the various committees. Under the umbrella of the larger committees were smaller, more focused committees, which were chaired by a member of the administrative, operations or steering committees. These committees included parking and transportation, academic affairs, grounds, engineering support, alternative transportation, regulatory issues, environmental safety, housing, and athletics to name a few**.**

The Board of Regents' Planning Template called for exploration in the following categories:

I History of the College or University
II Goals Formulation
III Existing Conditions
IV Future Campus Requirements
V Preliminary Physical Master Plan
VI Physical Master Plan
VII Implementation

The committees collected information from a variety of sources. Physical Plant provided much of the base map information including existing infrastructure, utilities, and building use. The greatest problems facing the design team again went back to the lack of planning and direction in the past. An example of issues that plagued the team's progress was no database that categorized room by use. Without having accurate building room inventory it was impossible to know room and building utilization ratios. Additionally, it was hard to know which departments were space

deficient, and therefore, impossible to project planned growth, much less strategic growth. The team found in so many areas the lack of reliable data from which the start to master plan.

The New President

The newly selected President, Michael Adams, saw the power of the planning process and donated large blocks of his time to direct the team. When there was a lack of detail or information he decided to keep moving the process forward but committed the institution to further study the problem areas. Two examples of major areas where the university lacked direction were the lack of an academic plan and a strategic mission. Dr. Adams would in time create a Vice President for Strategic Planning who developed both an academic plan and a strategic plan.

With all of the institutions past problems, the team developed a highly interactive and motivated core that developed innovative solutions to many problems that in isolation had vexed past administrations. The team developed Guiding Principles that all planning decisions were to honor: (The Guiding Principles are as follows)

1 CREATE THE OPTIMAL STUDENT ENVIRONMENT
2 EXTEND THE CHARACTERISTICS OF NORTH CAMPUS
3 DEVELOP A CONNECTED CAMPUS
4 DEFINE AND PROVIDE FOR THE CURRENT AND FUTURE NEEDS
5 PROVIDE FOR ACADEMIC AND STUDENT NEEDS ON CONTIGUOUS LAND
6 DEVELOP COMPREHENSIVE SOLUTIONS TO TRAFFIC, PARKING AND INFRASTRUCTURE ISSUES
7 PARTICIPATE IN REGIONAL COORDINATION
8 PREPARE FOR SUSTAINED IMPLEMENTATION

Breaking the Campus Down into Parts

Approximately six months after ASG started the planning process, the background research that included investigating past campus development, documenting existing conditions, goal setting and future campus requirements was complete. This background information gave

the team sufficient building blocks of information to base different design scenarios. Considerable amounts of time were saved with the adaptations of Daniel Sniff and Scott Burush's master planning efforts started two years before the ASG hire. An additional and controversial concept that was adopted and weaved into the master plan was the idea of Dr. John Crowley, Dean of The Landscape Architect School, to relocate Lumpkin Street from its present location to align with Pulaski Street further to the west of the main campus. Dexter Adams added another core concept with the premise that the master plan should link the different parts of the campus into one seamless and coherent campus.

The team subdivided the campus into seven districts or precincts. The team then designed five to eight different designs or venyets that were then discussed at town hall meetings for input and criticism by students, faculty and staff of the precinct. Cards were passed out to everyone who attended the meetings, and team members requested participants to write any comments down and mail them to the team. From these meetings, the team used the suggestions to further refine the precinct designs into a final draft. The final draft was presented to the executive committee for approval and then to the Board of Regents.

1997 to Present

The Master Plan has served in many capacities for the administration of Dr. Michael F. Adams. The master planning process shed light on the fact that the University was woefully short in many areas. The shortage of space in areas such as teaching classrooms, general propose classrooms, student services space, and research laboratories was hampering academic and university advancement. Other findings revealed capital renewal needs for the existing physical plant exceeded $350 million.

In areas of strategic planning and academic planning, the process identified the same planning apathy that previous master planning endeavors produced. Large committees developed plans, but the plans were never implemented and in time were forgotten. Dr. Adams used as a platform the Master Plan to direct a new strategic plan led by Dr. Donald Eastman and a new academic plan led by Robert Boehmer. Both of these plans were weaved into the Master Plan to create a triad approach for decision making for the institution. Time will tell if the decisions of Dr. Adams and his senior administrators were correct and changed the course of the University of Georgia or not, but during the ten year period immediately following the implementation of the 1997 Master Plan, the University has experienced the largest physical growth in any ten year period of time in its history.

Figure 5.1: 1997 Master Plan

CHAPTER 6

RECOMMENDED SUSTAINABLE GUIDELINES

The Growing Acceptance of LEED

The 1997 Master Plan for The University of Georgia evolved and grew with the changing needs of the University in all but one way, adapting to a sustainable or green philosophy of planning and building. There has been some progress in following the United States Green Building Council Leadership in Energy and Environmental Development (LEED) Guidelines, but these strides have been limited and do not follow an executive or strategic directive. Based on the U.S. Green Building Council definition, sustainable designed building classifications include Certified (low end), Silver, Gold and Platinum (top end). The range and differences in LEED levels are complex and measured based on a scoring system which includes six criteria: sustainable site, water efficiency, energy and atmosphere, materials and resources, indoor air quality, and innovation and design process. The score for the building determines where it ranks on the scale. The goal is an energy efficient building that harnesses natural resources such as the sun's heat and water for use in the operation of the building or surrounding area. Many LEED certified buildings also provide "ecological space for plants and local fauna to move in and through green roofs." (Busby)

By studying past planning failures, one can see that without executive approval years of planning effort can result in a costly waste of time and energy on the part of dozens of people. It is often said that the University should embrace the U.S. Green Building Council LEED guidelines, but is it that simple? How does a university decide to adopt a set of guidelines that

will have profound impacts on current and future grounds and facilities decisions? Also, in light of the various definitions of sustainability as reflected in Chapter 1, what are the appropriate guidelines? What is the process for implementation?

A first step in gaining knowledge of sustainable principles is to look to other university's sustainable directives. (Appendices D-F) Without exception, universities do not simply accept LEED as a standalone standard. A quick review of other university's sustainable principles reveals a total integration of these principles in almost every facet of life on the campus. Universities are complex communities with various factions that, by their very nature and design, do not accept edicts very readily. Design professionals must understand their clients, the universities, to provide quality workable solutions to problems. Understanding how an idea like sustainable guidelines become policy is helpful in insuring success in drafting the guidelines.

Sustainable Building Design Elements

Using the success of the Master Plan process, which incorporated the committee method, as a model of success for developing sustainable guidelines, what will sustainable buildings and grounds look like? The following is not a complete set of sustainable building design elements but is intended to illustrate how the buildings and grounds will take on a different aesthetic than non-green buildings.

Starting with site selection, architects must have the freedom to evaluate multiple sites to choose the most compatible site for the building program. On a campus this can be complicated by existing buildings, adjacency issues of similar programs or dissimilar programs, building heights, prevailing winds, etc. In public universities, there is always a desire to maximize the building size because receiving funding for a new building takes around ten years. The overriding factor is constructing the most square footage for which the state will give funding.

Couple these factors with the normal politics on a college campus and the design team has some real challenge.

Passive solar design principles will drive the design team to respect the sun's daily and seasonal movements. Buildings will have minimal western exposure, because the setting sun penetrates deep into windowed spaces and substantially increases solar gain, which taxes the mechanical systems. If western elevations are unavoidable, then the elevation will be required to utilize heavy overhangs, deep inset windows, or solar shading of various types. Northern elevations, for the most part, will be heavily glazed to take advantage of the indirect light and afford the users daylight without turning on lights. Also, occupants who can take advantage of north light will be clustered on this side of the building. Southern exposures will have double duty. In the summer months, sun light will need to be blocked with solar shading devices. In winter the solar gain from the windows can be utilized to heat the spaces or harnessed to heat the building. By selecting building materials that absorb the solar radiant heat and storing it in thermal mass, architects can even out the outdoor temperatures. Light shelves can reflect light upward to take advantage of natural light and also block harsh sun light that enters the space at undesirable angles.

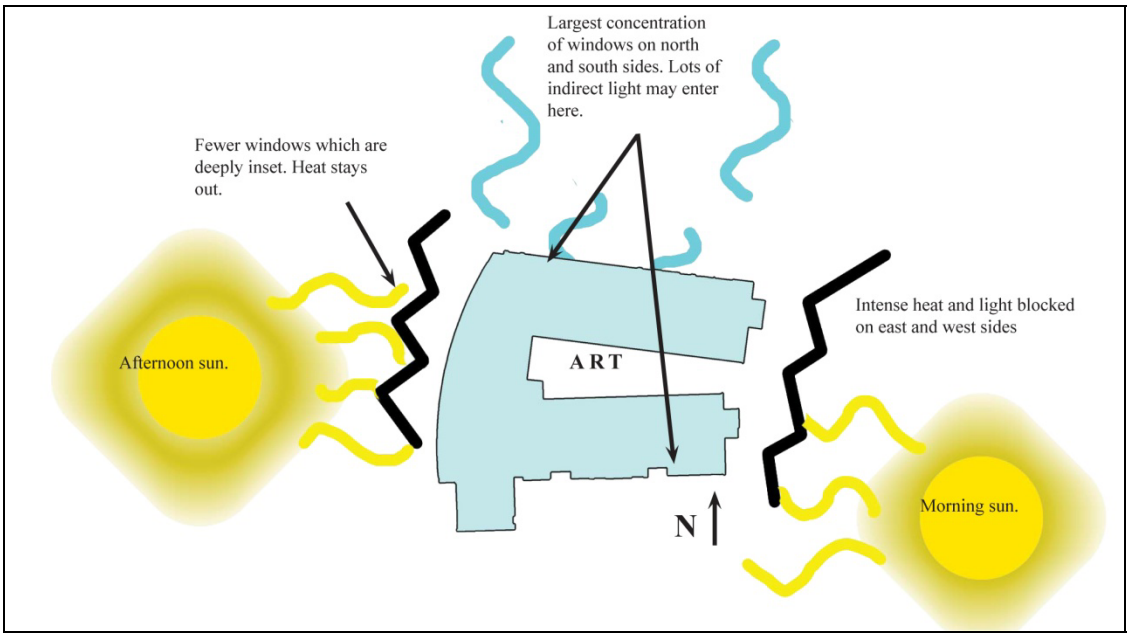


Figure 6.1: Passive Solar Design for the Lamar Dodd School of Art

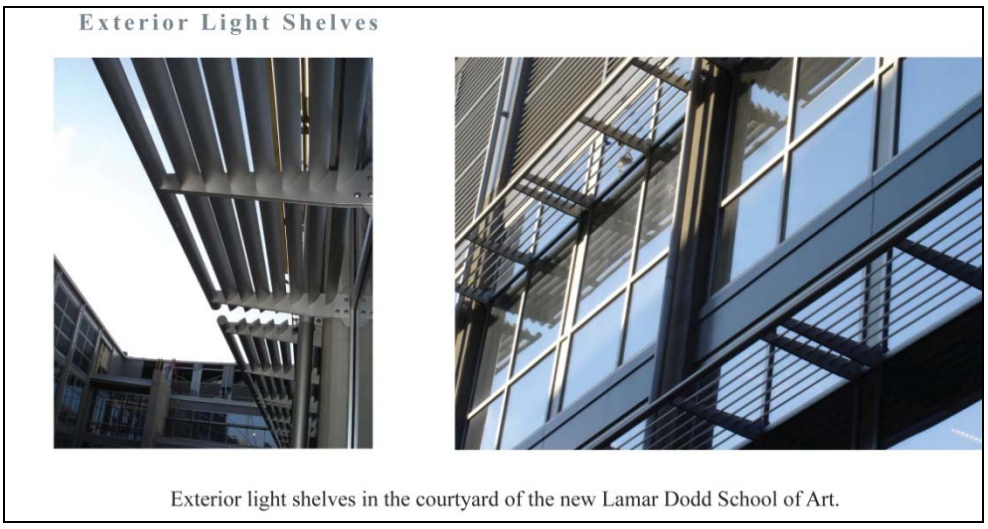


Figure 6.2: Optimized Solar Lighting

Figure 6.3: Examples of Maximized Daylighting in the Lamar Dodd School of Art

The use of natural ventilation has become popular again, and properly designed buildings can employ systems that pull the air throughout the building during non-peak times of the year. The use of natural ventilation requires operable windows, higher than normal ceiling heights, open vertical areas that allow air to flow upwards, like atriums, and building orientation that maximizes the prevailing breezes. Natural ventilation requires an understanding of the climate and what times of the day and year to open the windows. Most building operators resist operable windows because coordinating occupants to open and close windows in large buildings is often difficult.

Photovoltaic systems, which convert solar heat into electricity, and hot water heating systems are two building systems that harness the sun's power. Both systems are increasing in popularity, require solar orientation, and are generally installed on the roofs of buildings. Since many campuses have rigorous aesthetic standards, both photovoltaic and hot water heating systems will have to be incorporated into the design standards or imaginative locations will have to be selected. Similar to natural ventilation, these systems also have limitations depending on the region of the country.

Figure 6.4: Example of Photovoltaic Installation

Creating a sense of place by using a concept referred to as bioregionalism is another sustainable design element. Regional building materials should be used to lessen the cost of transporting materials and lessen the impact on the environment. Using indigenous materials and designing buildings as they were designed before the elaborate transportation system we have now was in place will help restore regional vernacular quality to the architecture. The vast majority of buildings built today disregard the regional environment and use materials transported hundreds and thousands of miles. By making use of local materials, the buildings will resemble the region and not anywhere USA. Bioregionalism also refers to the carrying capacity of the region. In other words, how many people living in a given region can the water, air and land support? This is a complex question that has far reaching consequences. In the north Georgia area this past year, a drought brought to the forefront the very question of bioregionalism. The question most asked during the drought was have we overbuilt the region?

If bioregionalism is a factor for places of higher education, will administrators turn students away? Do we have a higher moral obligation to the region's environment than our educational mission?

Topography is a key factor in sustainable design. The 1852 painting of the University of Georgia from Carrs Hill (see page 9) reflects building before the bulldozer. Once man developed heavy equipment to move the earth with little effort, the once formidable hills were cut up and moved at the architect's whim. Minimized disturbance to the site character, skyline, vegetation, hydrology and soils should all be principles of sustainable design. With each sketch, respect of the existing site conditions should be the end result.

Building systems should be the very highest performance systems on the market, and the cost associated with these systems should be included within the budget established. Each region has its own climate and sub-climates. Understanding these climates and designing heating, ventilation, and air conditioning (HVAC) systems that absolutely use the minimum amount of energy is vitally important. Most colleges employ chilled water and steam loop systems. These loop systems share the load by looping several buildings together, thereby shaving off the high energy draws during the extreme parts of the heating and cooling cycle. By adding cooling or heat to the loop during peak demand, the buildings are highly efficient to operate. The loop ensures no single building is drawing excessive amounts of energy, while providing redundant backup. The air handler machines that service each floor can be sized much smaller, thereby saving even more energy. Even though loop systems are efficient, there are numerous devices that can be added to improve energy efficiency, such as energy wheels, which have proven a cost pay back in four to five years.

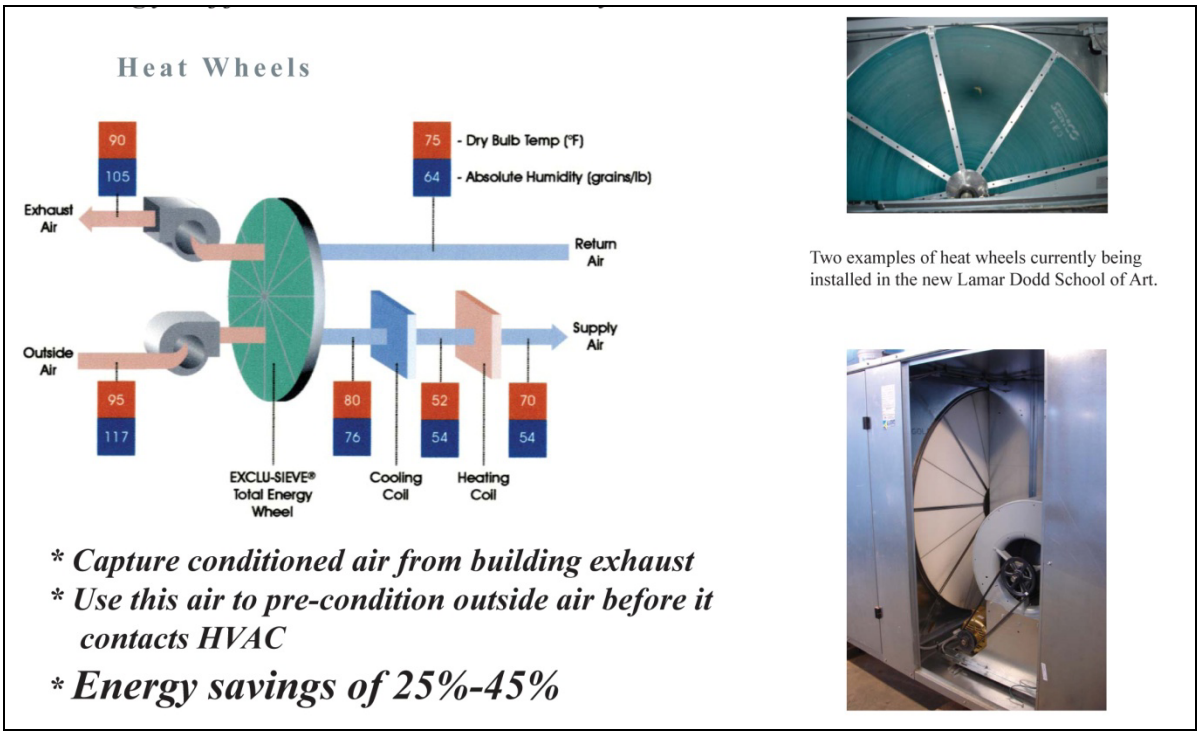


Figure 6.5: Energy Efficient Mechanical System using Heat Wheels

The grounds of the sustainable campus will be designed far differently than conventional campus plans. A good starting point will be understanding the different watersheds that make up the campus. This includes visual bodies of water as well as water flows under the ground. Hydrological consideration will greatly influence the location of the buildings, walkways and infrastructure of the campus. Waterways have been altered in the past - filled in, rerouted through piping systems or any numbers of different methods. Administrators must decide if they will correct the errors of their predecessors or just keep developing with a new understanding of trying to do no further harm. The Georgia Institute of Technology has taken a bold step by mapping the original watersheds, digging out hundreds of yards of dirt and restoring the natural flow. Whichever course the University of Georgia takes to respect the watersheds, large parts of the campus will need to be preserved with no-build areas. Buffers, setbacks and restoration will

be part of a sustainable plan. Watersheds are part of larger river basins, which in America, are almost all in decline. The concept of placing buildings intentionally at a low point in the watershed to retain, clean and slow water movement is part of good sustainable design principles. This practice can employ constructed devices such as rain gardens, runtals, or bio-retention areas to clean, store, reuse and filter water run off that is polluted.

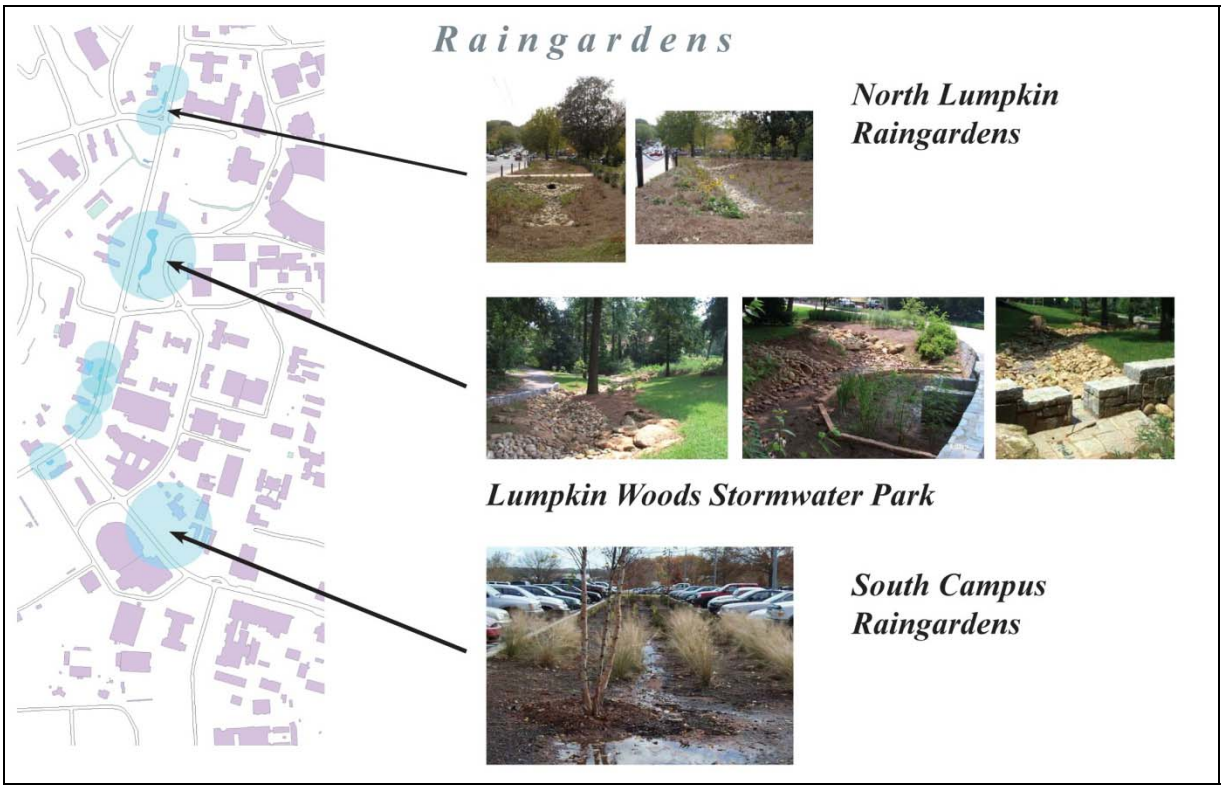


Figure 6.6: Raingardens installed on The University of Georgia Campus

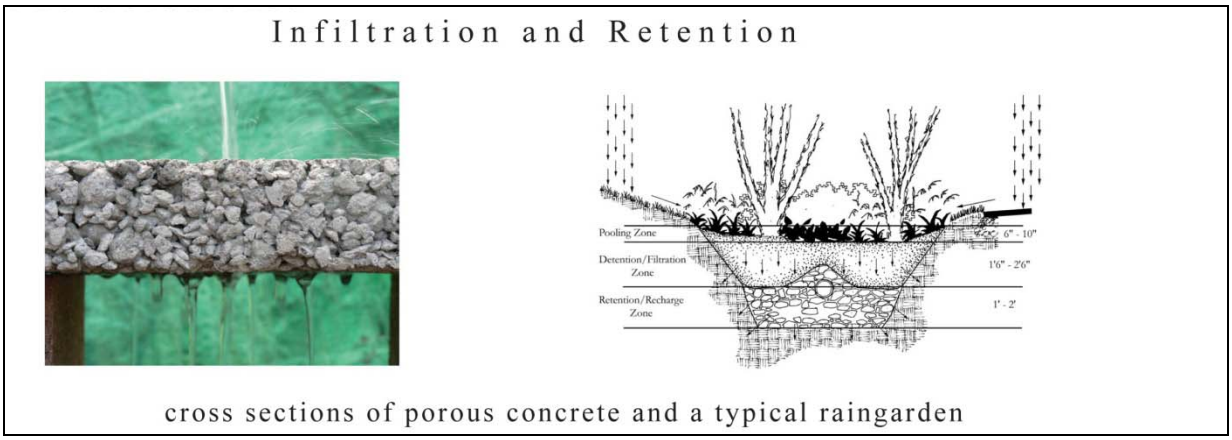


Figure 6.7: Infiltration and Retention

Plant materials should be indigenous to the region and planted in locations where the plants would have grown and adapted to the environment naturally. Like so many parts of sustainable design, concepts like this seem obvious, but in fact they are not. In most regions of the country there is a battle being waged against invasive plants. Plants that are not native to the region often thrive, proliferate and eventually take over, killing the natural plant life. In addition to harming native plant life, they change the landscape and often create numerous problems for wildlife.

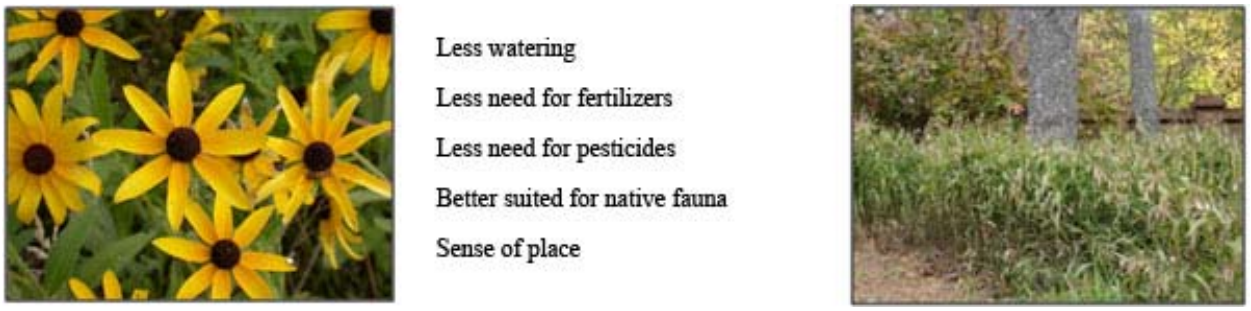


Figure 6.8: Benefits of Native Plants

Cisterns are part of the overall options for water reuse. Cisterns can store water collected from the site, roof, air conditioning condensate, parking, sidewalks and other water sources that are not sanitary in nature. This water can then be used a second time for flushing plumbing devices, watering plants and grass, etc. The capture and reuse of this precious resource is critical in all regions of the country. Below are examples of cisterns being installed on the University of Georgia's campus.

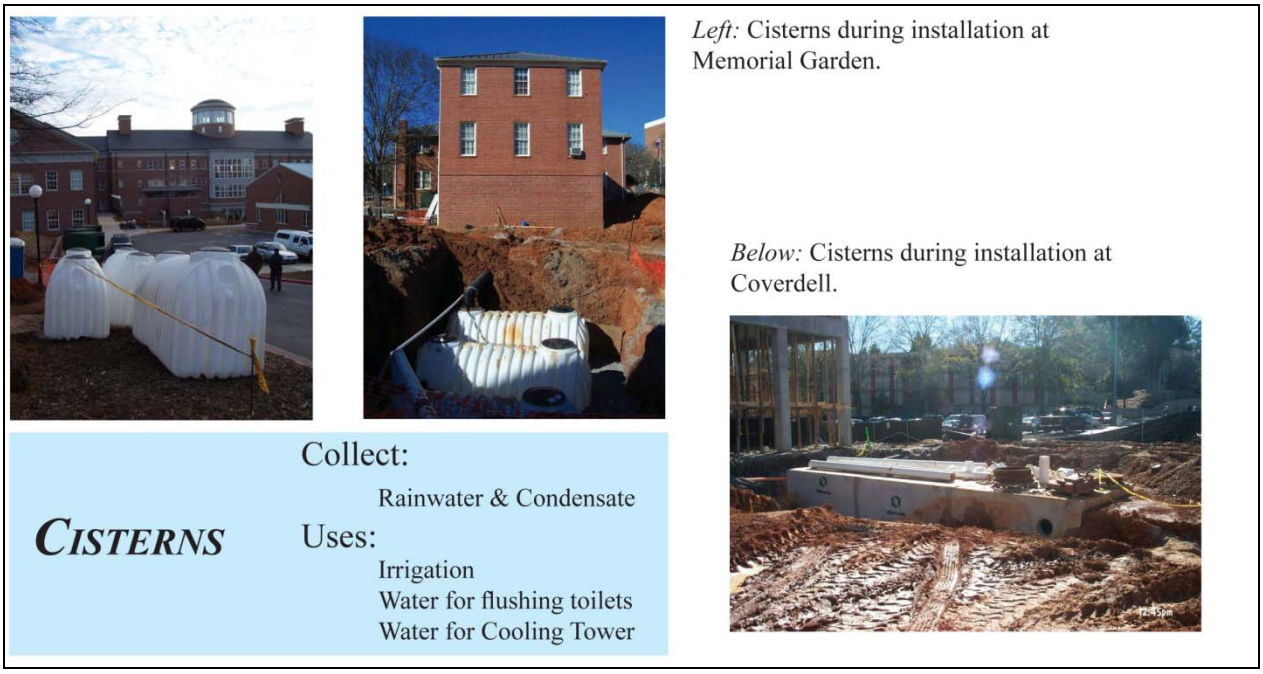


Figure 6.9: Cisterns

In conclusion, sustainable design and sustainable technology have their own set of rules to which designers must adhere, otherwise the building systems simply will not function to their design standards. Campuses, like the University of Georgia, that currently have aesthetic design guidelines, which make it hard if not impossible to design a high level sustainable building, will have to change. The conventional rules of campus planning - building buildings parallel and

perpendicular to frame green spaces like Josiah Meigs and so many of his counterparts did for hundreds of years - will also have to change. The rules of planning for a sustainable campus are a new paradigm. The new paradigm will change how we interact with the environment, making the user change from those traditional ideas to working with the environment.

College campuses that have established sustainable principles and guidelines have found that because of the diversity of their environment and the various climate conditions that exist, a simple list of adoptable criteria is not possible. Groups of diverse experts work to establish these guidelines based on the geographic location of the campus. Sustainable principles transcend the buildings and grounds to policy and curriculum. So by studying other campus sustainability guidelines and principles, the first observation is how unique and customized they are to the specific campus. Only by having a holistic approach to developing these principles can an institution successfully come close to a true sustainable direction.

The four basic components for sustainability development start with instructional strategic directives which will guide all other activities. These strategic planning imperatives are intended to point the institution in a direction that can be obtained within a defined time period, usually five to ten years. Under the umbrella of these strategic directives, the academic plan is formed. A comprehensive academic plan that includes classes in sustainable philosophy, practices, outreach, research, majors, and degrees can support the institution's sustainable direction. A master plan should incorporate the academic and strategic directives. Finally, a complete shift in business functions support sustainability in as many areas as possible.

A cross-campus committee structure comprised of many different and diverse participants would ultimately develop the sustainable guidelines. The guidelines for the University of Georgia might include the following:

1) Planning for Conservation
2) Integrated Design
3) Design and Construction Commissioning
4) Operations and Existing Building Commissioning
5) Lowest Life Cycle Cost
6) Stormwater Master Plan
7) Site Buffers and Stream Buffers
8) Soil Management and Erosion Control
9) Native Plant Selection
10) Dark Sky Compliant Lighting Standards
11) Water Conservation
12) Transportation Design and Implementation
13) Heat Island Reduction
14) Waste Management
15) Energy Reduction Goals of 25% or More
16) Stop Using Coal as a Fuel Source
17) Day Light Harvesting Standards
18) Cross Ventilation Design Standards
19) Views and Vistas Protection
20) Waste Reduction and Management

CHAPTER 7

A CASE STUDY OF SUCCESS

The Campus of the Future

Starting with strategic planning, academic planning and physical planning, that complete and bond the University's mission, planners must work with agreed upon definitions and a directive that is obtainable. With our society rapidly depleting the natural resources that sustain our planet, campus designers have the ability to incorporate into the design of the buildings and grounds methods of protecting nonrenewable resources. The following data illustrates what impact these decisions will have on the quality of the environment on campus life and the planet at large:

> More than 60% of all electricity used and more than 30% of all energy consumed in the United States is used in buildings.
>
> More than 35% of all municipal solid waste produced comes from building construction and operations. Current construction practices create 2 to 2-1/2 pounds of solid waste per square foot.
>
> Building construction consumes 40% of raw stone, gravel and sand, and 25% of virgin wood.
>
> 25% of all water is used in buildings.
>
> (Data from: The U.S. Green Building Council and The Ecology of Architecture by Laura Zeiher, 1996)

The University of California at Merced

Can we build to a high level of sustainable design and if so what does a campus look like that has committed it to these principles? The best example of this is the University of California, Merced. In 2002, the Regents of the University of California System started planning

their tenth campus and first regional campus built in forty years. The planners started with undeveloped farm land and established bold goals to compliment the first major campus of the twenty-first century to be built in America. Among the many goals of the "Long Range Development Plan 2002" was the incorporation of "Sustainable Planning and Design." According to then California governor, Gary Davis, " … California is committed to providing leadership on energy, environmental, and public health issues by implementing innovative and resources-efficient public building design practices…" and "… opportunity exists for the State of California to foster continued economic growth and provide environmental leadership by incorporating sustainable building practices."

In 1999, the firm of Skidmore, Owings & Merrill, SOM, of San Francisco was hired as lead architects to master plan the new campus at Merced. A collaboration between SOM, Fernau & Hartman Architects, Thomas Hacker Architects and EHDD Architects was formed to develop guidelines that would establish cohesive campus architecture without relying upon the imitation of any one design or style. These guidelines had to remain flexible because the sustainable objectives called for exceeding the state energy standard with 25% less energy use than any other state institution. This goal was set for the first eight buildings. After the first eight, the percentage would increase to 50% less energy use. The other standard established was all buildings constructed would meet or exceed silver LEED criteria. The guidelines had to be flexible but, at the same time, had to work to tie the campus together architecturally. (Skidmore Design)

The site selection and ultimately the campus layout were driven like all decisions at Merced by the sustainability of the site ecology. The original land area of 2,000 acres was subdivided into three areas. The first was a 750 acre protected reserve, the second was 340 acres

for future expansion, and the balance was for the first phase of the new campus. After vernal pools were discovered, SOM moved the location of the first phase from high ground to lower ground that would reduce the environment impact of storm water runoff. The relocation added the benefit of moving the campus closer to the city of Merced. The close proximity helped with biking or walking to the town center, strengthening the physical, social and economic relationship between the two entities. Using a central grid arrangement as a template, the grid followed town layouts of the region, provided a logical organizational format for future growth and started to build a pattern language that was easy to understand. The grid also helped with the east, west orientation to take advantage of the best building arrangement for solar direction. The grid was not a rigid street layout, but a guide for planners to be used to zone like similar activities or buildings. The grouping of like similar activities helps to reinforce a sense of place. The grouping concept clustered interdisciplinary activities within zones with the intent to facilitate collaboration and interaction among students, facility and the community. The schools positioned within the campus plan's core support services like the main library, which is the center of undergraduate programs, social sciences, humanities, arts. This helps enliven the core of campus. Professional programs and sports, which are more standalone and need less support from adjacent buildings, are placed on the outer edge. The utility corridor runs down the center of campus, so heavy base users of steam, hot water, chilled water and electricity, like science and laboratory buildings, are clustered around this corridor, which is close to the Central Plant. The main street is a pedestrian spine or green space where students can flow through campus like the traditional campus plan. Man-made canals that run along side walkways provide natural evaporative cooling and an aesthetic ambience. Lake Yosemite provides a backdrop and a recreational outlet for the campus. In the future, the lake will be incorporated into the heating

the cooling strategy with cooling exchangers in the lake to help mitigate the temperature differential of the utility plant. (Skidmore Design)

Figure 7.1: The University of California at Merced Master Plan

The first building built was the Central Plant. SOM and Fernau & Hartman Architects designed the building to Gold LEED standards that utilized a two million-gallon chilled water tank for storage. The Thermos, as it is called, is the tallest structure on campus and symbolizes the sustainable nature of the campus. The high-energy efficiency of the cooling is obtained with off hour energy consumption. Cooled at night and distributed in closed loop systems during the day ensures maximum efficiency. This strategy saves 33% off the electricity bill annually.

Along with chilled water, the plant also produces hot water for heating and steam for use in laboratories. The plant building earned LEED points by using recycled materials, low volatile organic compounds (VOC) products, sustainable harvested wood and other green strategies. Since this was the first building constructed on campus, the plant building received LEED credit points for storm water runoff and site lights standards. Also, because the plant will connect to all future buildings, the way was paved for credits when those buildings came on line. (University of California 1)

Figure 7.2: Central Plant at University of California at Merced

The budget for the first two buildings was established five years before start of construction. After five years, with no increases to the budget for inflation, value engineering almost derailed the sustainable plan before the first yard of concrete was poured. Hard decisions had to be made, and the administration felt if this campus was to be truly a campus of the twenty-

first century, they would make the compromises necessary to build in a sustainable way. With environmental responsibility at the forefront of the school's identity, the administration agreed to reduce the extra capacity built into all cooling and heating systems to the bare minimum. This translated into several uncomfortable days or nights during the year when temperatures swing below or above the mean temperature variant. This was a bold step that tells a great story about the University of California Merced's commitment today and for future students, faculty and staff. (University of California 1)

The second major problem came after the discovery of vernal pools and an endangered fresh water Fairy Shrimp. After several lawsuits and major redesign the SOM team found that by moving the original location of the campus from high ground to a mid point then the vernal pools would be protected and less run off from land disturbance would occur. (University of California 1)

Bike and pedestrian travel was integral to the plan despite temperatures of over 100 degrees fahrenheit in the summer. The first floors of the buildings are designed with large overhangs that shaded pedestrians and bike riders. The overhangs shaded sitting areas and other outdoors spaces. Lake Yosemite is the backdrop of the main campus. Designed to take advantages of the breezes, the buildings are kept open on the first floor to allow the breezes to travel through and not create hot spots on the leeward side. The breezes off Lake Yosemite can lower the temperatures by eight degrees. (University of California 1)

The second building was the Library and Information Technology Center. At 120,000 square feet, SOM created the most prominent building on campus. Built to Gold LEED levels, the two wings use natural ventilation, day lighting, and a large atrium that connects the two wings like a hinge. The elevations of the building reflect the passive solar design elements of

vertical and horizontal shading elements. The windows utilize low emissive and fritted glazing, which further adds to energy conservation. The solar shading devices change orientation and depth on each elevation as a response to the suns path. A vertical shaft through the building allows the heat to escape through louvers on the roof and harvests day light into the inter core of the building, thereby cutting down on electrical consumption. Similar to the Central Plant, the building's design utilized recycled materials, low emissions products and sustainable harvesting materials. (University of California 2)

Figure 7.3: Library at University of California at Merced – Sun Shading Devices

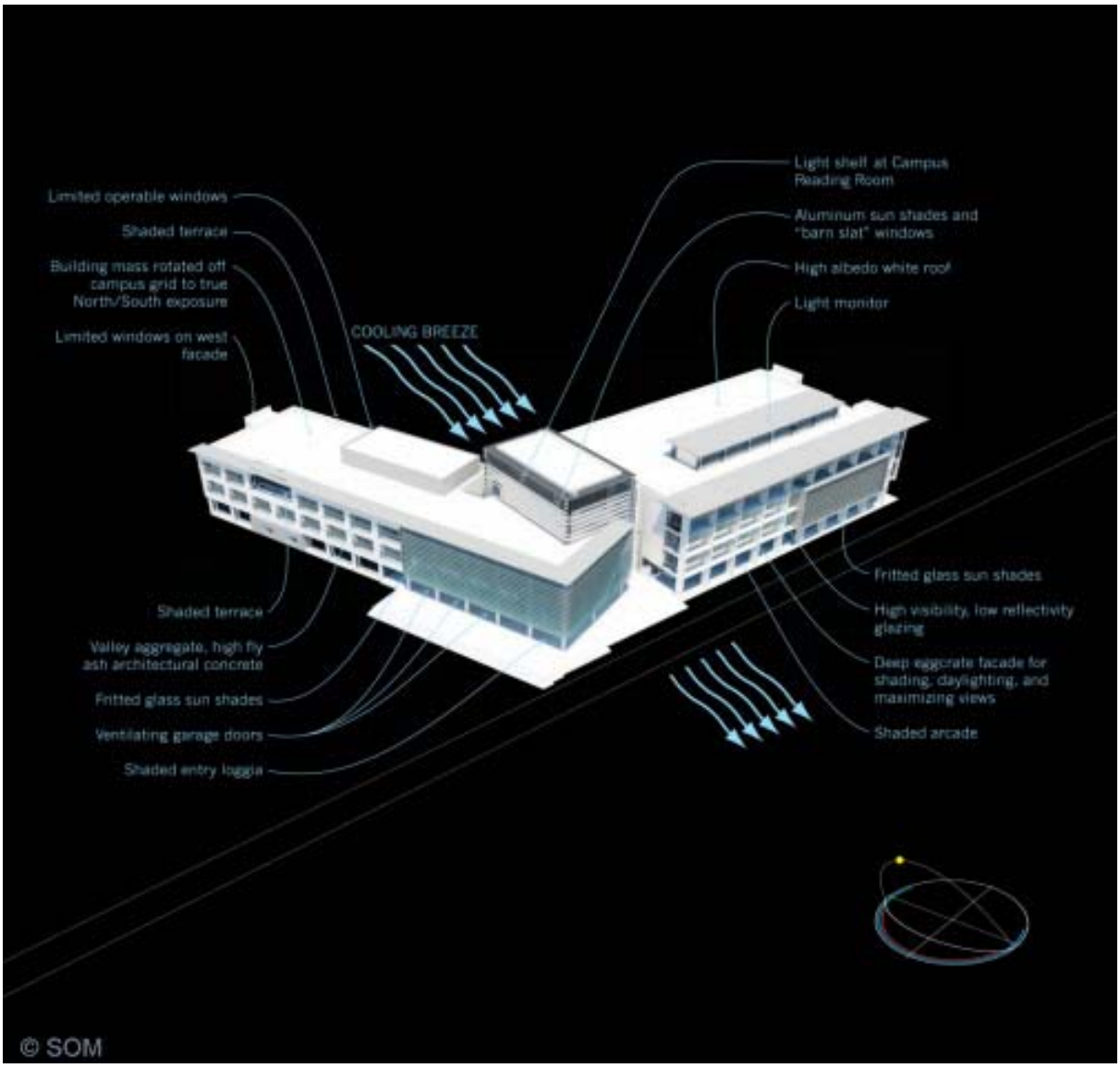


Figure 7.4: Diagram of Sustainable Design for Library at University of California at Merced

In section five of the 2002 *Long Range Development Plan for Merced* there is a sixty five page document tilted *Long Range Development Plan Elements* which for most colleges would be referred to as the physical master planning document. The following sections are the general categories:

Resources Conservation and Environmental Stewardship
Sense of Place
Land Use
Circulation and Parking
Utilities and Infrastructure
Open Space and Landscape
Building Design
Phasing Concepts
Plan Policies

What is noteworthy about the *Long Range Development Plan* is that it's not just a physical master planning document but a process document that is intended to be a compass to lead the way and not a road map. Included in the *Long Range Development Plan* is an academic plan, a land plan, a vision plan, a sustainable plan and design, a campus and community plan, a phased plan, and a parking, utilities, infrastructure plan that is written with the understanding that future requirements will change and the document must be flexible to accept change without locking administrators into decisions based on a 2002 document or 2002 standards.

Conclusion

The tangible measurement of any success is in the execution. Did Merced accomplish what the visionary leaders wanted in 1998? In most multi-year planning efforts, it takes decades to fully answer that question. In the case of Merced, almost seven buildings have been completed, all to the silver or gold level. The goal of 25% energy reduction was exceeded by more than twice the first year. Administrators have faced hard decisions with value engineering and strained budgets and kept to their core principles. Students are attracted to Merced because it is known for its sustainable philosophy. Students, faculty and staff know that when days are extremely cool or hot, discomfort is an acceptable price to pay.

Merced is a case study of success. Its planning document could serve as a foundation for the University of Georgia's Master Planning effort or other college and university sustainable

design developments. Once an executive administrators accepts a planning document like the Merced Long Range Development Plan, they can work to adopt a framework for the main campus.

Figure 7.5: Ariel Photograph of University of California at Merced Campus Under Construction

The current generation of students does not have to be convinced that mankind is behind global warming; they accept it, and they are demanding our action. In our hands as educators and design professionals are the tools to reflect the cultural aspirations of our society in our classrooms, in our architecture, and on our campuses. We hold in our hands the moral obligation

to change and educate the next leaders of our country. We also have an ethical responsibility to provide to our clients the highest quality, most sustainable learning environment we can design.

At universities across the country, curriculums are changing to reflect the sustainable movement. At the University of Georgia undergraduate students can receive a certificate from the Academy of The Environment. Business schools offer concentrations in environmental business, law schools have specializations in environmental law, and urban stream restoration is an area of Ecology that has evolved into a high demand major. Manufacturers are producing green products at an unprecedented pace. Sustainable designs, products, goods and services of all kinds are emerging and becoming main stream. Universities will change to meet this new direction.

Sustainable guidelines will alter the curriculum as well as the aesthetics of the campus. As seen in the case study at Merced, the building design responds to every aspect of the site and becomes an active player in the environment. The landscape will be changed as well, and the plant material will no long be solely aesthetic. The plants will work in a design to filter the water born pollutants that are transported during rain events. The building systems will be maximized for energy efficiency and minimized in excess capacity. All these will drastically change the campus as we know it today. The question for the University of Georgia administrators is how much long will they ignore the future?

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<www.unch.planning@edu>

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USEFUL WEBSITES

University Sustainability Programs

Michigan State University
http://www.ecofoot.msu.edu/
http://www.2020vision.msu.edu/index.htm

University of South Carolina
http://www.sc.edu/sustainableu/

Cornell University
http://www.sustainablecampus.cornell.edu/

Georgia Tech
http://www.sustainable.gatech.edu/

Harvard University
http://www.greencampus.harvard.edu/

Mississippi State University
http://www.abe.msstate.edu/csd/

North Carolina State
http://www.ncsu.edu/facilities/univ-arch/1-physical.htm

Penn State
http://www.opp.psu.edu/construction/upmp/index.cfm

Brown University
http://www.brown.edu/Departments/Brown_Is_Green/

University of Vermont
http://www.uvm.edu/greening/

Tulane University
http://green.tulane.edu/

Princeton University
http://www.princeton.edu/%7Eperc/PercIntro.htm

Carnegie Mellon University
http://www.ce.cmu.edu/GreenDesign/

State University at New York at Buffalo
http://wings.buffalo.edu/ubgreen/
http://wings.buffalo.edu/services/recycling/index.htm

University of Waterloo, Canada
http://www.adm.uwaterloo.ca/infowast/watgreen/

University of Michigan
http://www.umich.edu/~urel/stewardship/
http://www.snre.umich.edu/greendana/

University of Colorado
http://www.colorado.edu/masterplan/

University of Florida
http://www.facilities.ufl.edu/

University of Oregon
http://sustainability.uoregon.edu/search/index.php
http://darkwing.uoregon.edu/~uplan/LRCDPUpdateDraft%20PlanCover.html

UPenn
http://www.facilities.upenn.edu/environment/

Virginia Tech
http://www.unirel.vt.edu/MasterPlan/index.html

Florida Gulf Coast University
http://www.fgcu.edu/greenbuilding/

Oberlin College
http://www.oberlin.edu/ajlc/ajlcHome.html

University of Minnesota
http://www.uservices.umn.edu/sustainableU/index.html

Sonoma State University
http://www.sonoma.edu/ensp/etc/

Duke University
http://www.duke.edu/sustainability/

University of British Columbia
http://www.sustain.ubc.ca/

Ball State University
http://www.bsu.edu/greening/

UC Santa Barbara
http://bap.ucsb.edu/planning/0.design.html

UC Berkeley
http://sustainability.berkeley.edu/

UC Davis
http://www.ormp.ucdavis.edu/environreview/index.html

Cal State
http://www.calstate.edu/cpdc/

Northwestern University
http://www.northwestern.edu/fm/environmental_sustainability.htm
Other Sources of Information

US Department of Energy
http://www.sustainable.doe.gov/

National Wildlife Federation
http://www.nwf.org/campusecology/

Alliance to Save Energy (ASE)
http://www.ase.org

University Leaders for a Sustainable Future
http://www.ulsf.org/

Sustainable Development on Campus
http://www.iisd.org/educate/

Second Nature: Education for Sustainability
http://www.secondnature.org

Clean Air, Cool Planet
http://www.cleanair-coolplanet.org/for_campuses.php

US Green Building Council
http://www.usgbc.org

Green Building Information Council of Canada
http://www.greenbuilding.ca

Energy Benchmark for High Performance Buildings
http://www.newbuildings.org/ebenchmark/index.htm

EPA Energy Star for Higher Education
http://208.254.22.6/index.cfm?c=higher_ed.bus_highereducation

Advanced Buildings Guidelines: Energy Benchmark for High Performance Buildings
http://www.newbuildings.org/ebenchmark/index.htm

The American Institute of Architects-- 16 actual Green RFP's http://www.aia.org/pia/cote/rfp

APPA: The Association of Higher Education Facilities Officers
http://www.appa.org/

Building for Environmental Economic Sustainability (BEES)
http://www.bfrl.nist.gov/oae/software/bees.html

Building Commissioning Association
http://www.bcxa.org/

Building Green Publishers of Environmental Building News (EBN)
http://www.buildinggreen.com/

Business Case for Sustainable Design in Federal Facilities, Energy Efficiency and Renewable Energy (EERE) Federal Energy Management Program
http://www.eere.energy.gov

Center for Renewable Energy and Sustainable Technology (CREST)
http://crest.org/

World Green Building Council
www.worldgbc.org

E-Build
http://www.ebuild.com

EPA Green Buildings
http://www.epa.gov/greenbuilding/

Green Building Advisor
http://www.greenbuildingadvisor.com/

Green Round Table
http://www.greenroundtable.org/

High Performance School Design: Online Training for architects, Engineers
http://www.hpschooldesigntraining.com/nyserda/home.jsp

Managing the Cost of Green Buildings
http://www.ciwmb.ca.gov/greenbuilding/Design/ManagingCost.doc

National Renewable Energy Laboratory High Performance Buildings Research
http://www.nrel.gov/buildings/highperformance/

Rocky Mountain Institute
http://www.rmi.org/store/p385pid959.php

Sustainable Building Industry Council
http://www.psic.org/home/index.html

Center of Excellence for Sustainable Development
http://www.sustainable.doe.gov/

Whole Building Design Guide
http://wbdg.org/

State and City Programs

Austin, TX Green Building Program
http://www.ci.austin.tx.us/greenbuilder/

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http://www.builtgreen.org/checklist/checklist.htm

California State Government Building Better Buildings: An Update on State Sustainable Building Initiatives (Blueprint 2003)
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http://www.gggc.state.pa.us/publictn/gbguides.html

New Jersey Higher Education Partnership for Sustainability
http://www.njheps.org/projects/greenbuildings.htm

Minnesota Sustainable Design Guide
http://www.sustainabledesignguide.umn.edu/MSDG/guide2.html

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http://www.ci.nyc.ny.us/html/ddc/html/ddcgreen/highperf.html

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APPENDIX A

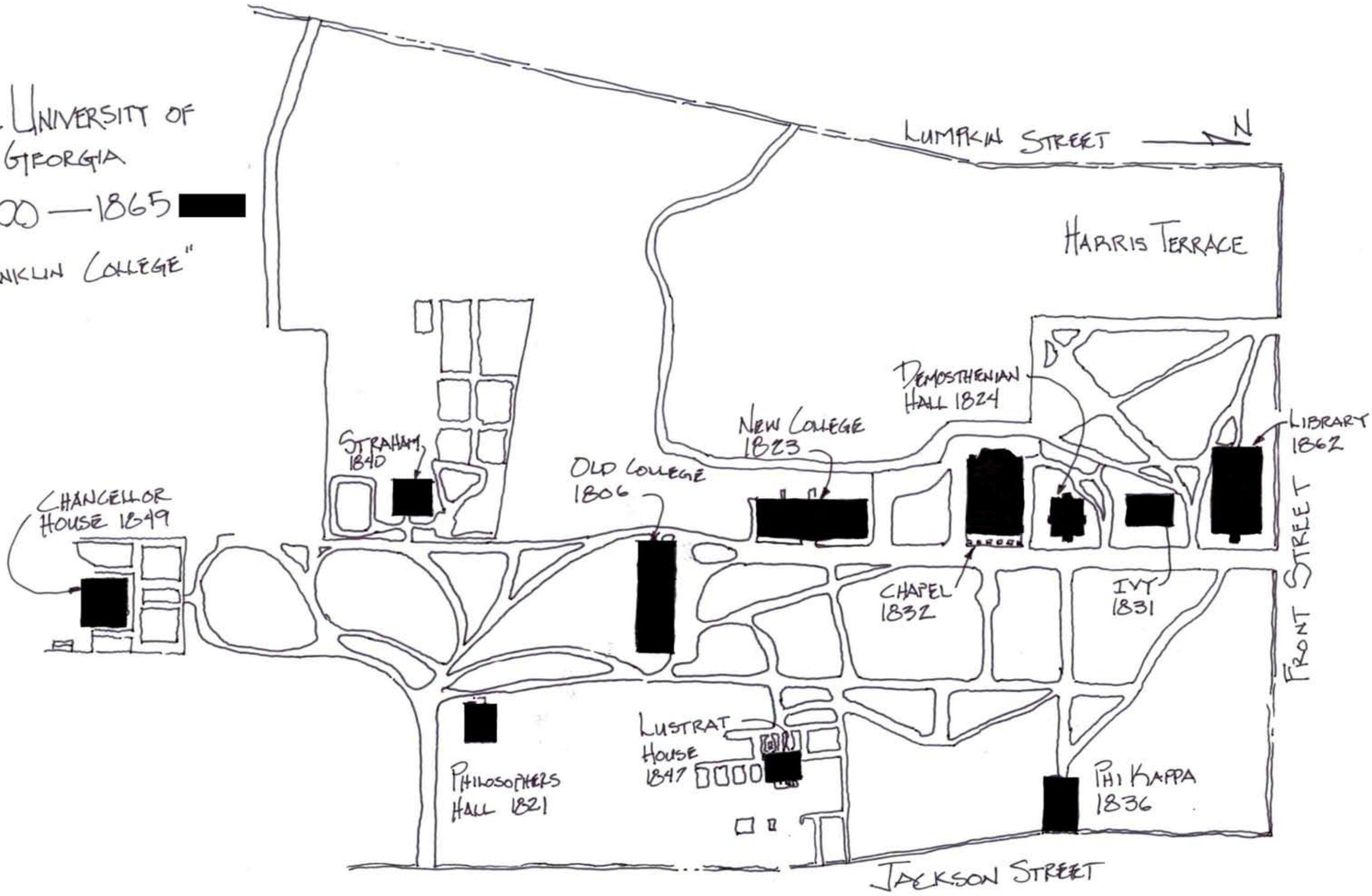
THE UNIVERSITY OF GEORGIA 1800-1865

(North Campus Figure Ground Drawing)

THE UNIVERSITY OF GEORGIA

1800—1865

"FRANKLIN COLLEGE"



APPENDIX B

THE UNIVERSITY OF GEORGIA 1865-1945

(North Campus Figure Ground Drawing)

The University of Georgia

1800 - 1865

1865 - 1945

Lumpkin Street — N

Gilbert Hall 1942

Meigs 1905

Brooks Hall 1924

Denmark Hall 1901

Candler Hall 1901

Moore College 1874

Old College 1806

Chancellor House

Law School 1932

Strahan House 1840

New College 1823

Chapel 1832

Academic 1907

Terrell Hall 1905

Broad Street

Waddell 1821

Peabody Hall 1913

Lustrat House 1903

Library 1903

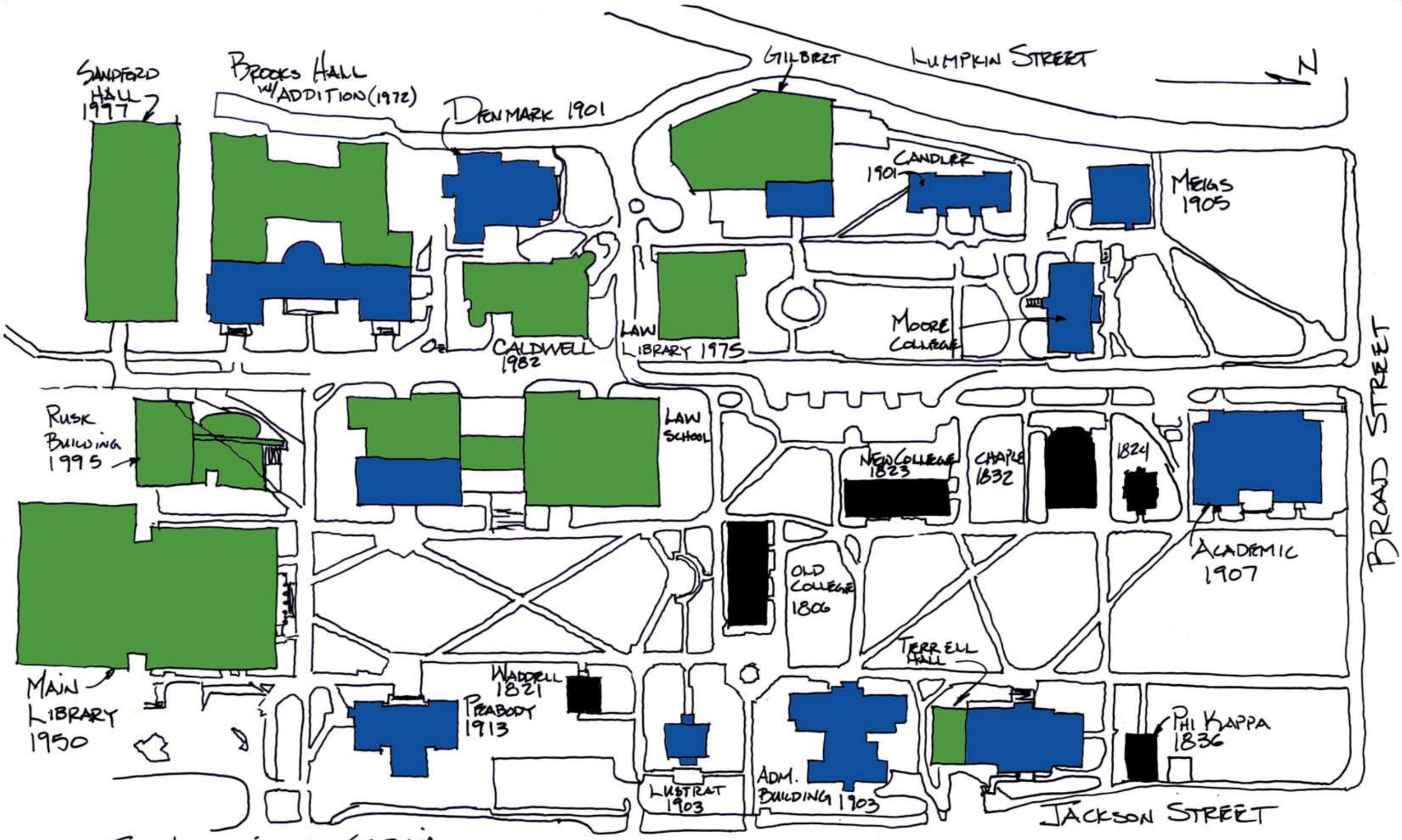
Phi Kappa 1836

Jackson Street

APPENDIX C

THE UNIVERSITY OF GEORGIA 1945-2008

(North Campus Figure Ground Drawing)


SANFORD HALL 1997
BROOKS HALL w/ ADDITION (1972)
DENMARK 1901
GILBERT
LUMPKIN STREET
N
CANDLER 1901
MEIGS 1905
CALDWELL 1982
LAW LIBRARY 1975
MOORE COLLEGE
RUSK BUILDING 1995
LAW SCHOOL
NEW COLLEGE 1823
CHAPEL 1832
1824
ACADEMIC 1907
BROAD STREET
OLD COLLEGE 1806
TERRELL HALL
MAIN LIBRARY 1950
WADDELL 1821
PEABODY 1913
PHI KAPPA 1836
LUSTRAT 1903
ADM. BUILDING 1903
JACKSON STREET
THE UNIVERSITY OF GEORGIA
1800 — 1865
1865 — 1945
1945 — 2008

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   2. University Reviews and Presentations
   3. Conference Memoranda
   4. Outside Reviews

D. Construction Contracts – Forms of Delivery
   1. Construction Manager at Risk (or as Agent)
   2. Single Prime Contract

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   1. General Principles Governing Site Design
   2. Land Development Guidelines
   3. Water Resource Management
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   5. Building Demolition
   6. Site Utilities
   7. Geotechnical Engineering
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   9. Construction Staging Areas
   10. Tree Protection
   11. Site Work
   12. Landscaping
   13. Pesticides and Chemical Fertilizers
   14. Termite Control
   15. Construction and Demolition Waste
   16. Outdoor Recycling and Solid Waste Collections Sites
   17. Hardscape
   18. Bicycle Racks
   19. Bus Stop Shelters
   20. Roads
   21. Walkways
   22. Parking
   23. Pedestrian Safety
   24. Traffic Control Plan
   25. Driveways
   26. Loading Docks and Trash Receptacle Sites
   27. Street and Roadway Utility Repairs and Replacements
   28. Exterior Lighting
   29. Site Appurtenances
   30. Permits and Approvals

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C. Space Planning Requirements
    1. Accessibility
    2. Building Service Areas
    3. Classroom Requirements
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    2. Soils
    3. Dangerous Chemicals, Liquids, and Gases
    4. Radiation Sources

E. Construction and Demolition Waste Management

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    3. Design Guidelines for Fire Safety
    4. Erosion and Soil Control Design Appendices
    5. Design Guidelines for Permanent Employee Fall Protection
    6. Construction Design Guidelines for Occupied Buildings
    7. Historically Underutilized Businesses Plan
    8. Moving Procedures for Bond Projects
    9. Construction Trailer Parking Permits
    10. Sustainability
    11. Accessibility
    12. Classroom Design Advisory Committee
    13. Surveying Guidelines

B. Hazardous Material Guidelines
    1. Asbestos Abatement
    2. General Procedure for Paint Film Stabilization
    3. Industrial Hygiene Design Guidelines
    4. Lead Based Paint Management for Renovations/Demolition for Existing Buildings
    5. Design Guidance on Prevention of Moisture and Mold Growth Problems
    6. UNC Contractor Guidelines for Hazardous and Universal Waste Issues

C. Equipment Guidelines
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    2. Fire Alarm System
    3. Hydraulic Passenger Elevator

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D. Division 4 – Masonry
E. Division 5 – Metals
F. Division 6 – Wood & Plastic
G. Division 7 – Thermal & Moisture Protection
H. Division 8 – Doors and Windows
I. Division 9 – Finishes
J. Division 10 – Specialties
K. Division 11 – Equipment
L. Division 12 – Furnishings
M. Division 13 – Special Construction
N. Division 14 – Conveying
O. Division 15 – Mechanical
P. Division 16 – Electrical

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    2. Programming Check List
    3. Site Analysis Check List
    4. Pre-Design Check List
    5. Schematic Design Check List
    6. Design Development Check List
    7. Construction Documents Preparation Check List
    8. Pre-Bid Check List
    9. Construction Documents Check List
    10. Forms Required for Consideration of Bid
    11. Post-Bid Check List
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THE UNIVERSITY OF VIRGINIA SUSTAINABLE DESIGN GUIDELINES

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GUIDELINES FOR SUSTAINABLE BUILDINGS AND ENVIRONMENTAL DESIGN

"The earth belongs to the living. No man may by natural right oblige the lands he owns of occupies, or those that succeed him in that occupation, to debts greater than those that may be paid during his own lifetime. Because if he could, then the world would belong to the dead and not to the living."

Thomas Jefferson, 1789

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