North Florida Community College

Sustainable Design for A Rural Campus

Madison, Florida

A Senior Capstone Project

By

Keith Ward

Spring 2011

Faculty Advisor: Les Linscott

University of Florida: Department of Landscape Architecture

The University of Florida
College of Design, Construction, and Planning

North Florida Community College

Sustainable Design for A Rural Campus

Madison, Florida

An Undergraduate Thesis in
Landscape Architecture

By

Keith Ward

Faculty Advisor
Les Linscott

2011

Submitted in partial fulfillment of the degree Bachelor in Landscape Architecture

Table of Contents

Project Introduction

- Project Summary ---------- page 4
- Site Location ---------- page 5
- Mission Statement ----------page 6
- Site Description ----------page 7
- Context Description ----------page 8

Program, Goals, and User Analysis

- Program Development ----------page 10
- Goals and Objectives ---------- page 11
- User aAnalysis ----------page 12

Existing Conditions

- Unique Site Features ----------page 14
- Architecture Styles of the NFCC Campus ---------- page 15
- Building Inventory and Location ---------- page 16
- Current Methods of Stormwater Management ----------page 17

Context Analysis

- Landuse Map ----------page 19
- Regional Watershed, Topography, and Wetlands.----------page 20
- Context, Watershed, and Drainage Patterns ----------page 21

Table of Contents

Site Analysis

- FEMA Floodplain 2010. ---------- page 23
- Soil Types and Drainage Properties---------- ------- page 24
- Vegetation---------- page 25
- Soil Suitabilities---------- page 26
- Vehicular Circulation---------- page 27
- Pedestrian Circulation ---------- page 28

Site Synthesis

- Synthesis and Conclusion. ----------pages 30-31

Concept Development

- Concepts 1 and 2----------pages 33-34

Masterplan

- Masterplan ---------- pages 36-37
- Planview Enlargements----------pages 38-40
- Sections ---------- page 41
- Stormwater Wetland ---------- pages 42-43
- Perspectives ---------- pages 44-51

Case Studies

- Evergreen State College ---------- page 53
- Sidwell Friends School (Middle SchoolRenovation and Addition) ---------- page 54
- Florida Aquarium Parking Lot and Queuing Garden ---------- page 55

References ---------- pages 56-57

Project Introduction

Project Summary..... page 4

Project Location..... page 5

Mission Statement..... page 6

Site Description..... page 7

Context Description..... page 8

Project Introduction

Van Priest Auditorium over-looking one of several existing lakes found on the property.

General Information:

Project Title:

•*North Florida Community College: Sustainable Design for a Rural Campus*

Project Type:

•*Institutional/Education Campus Renewal*

Location:

•*Madison, Florida*

Client:

•*North Florida Community College*

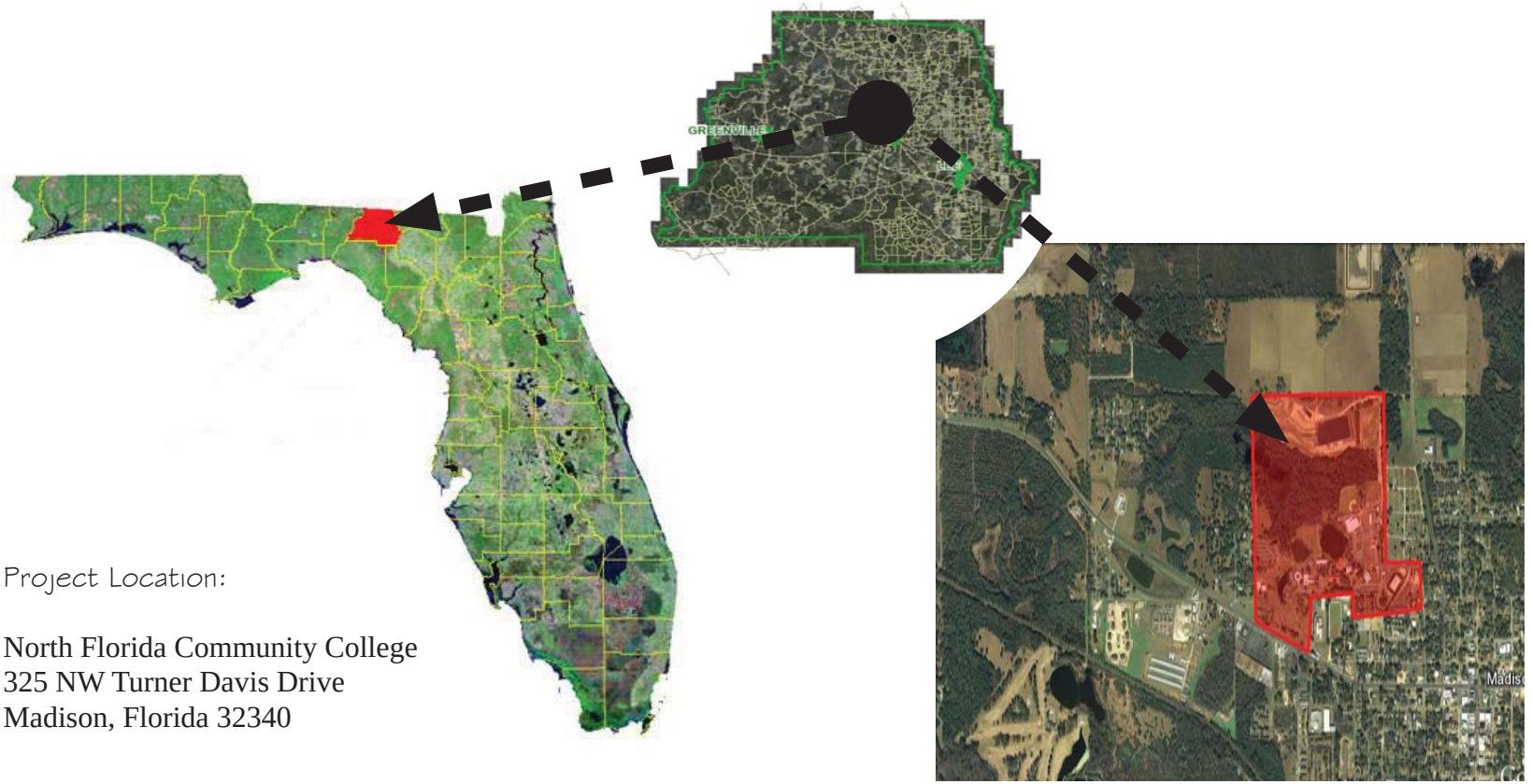
Project Summary:

The existing site of the North Florida Community College (NFCC) campus is located in the rural town of Madison, Florida. It is a small community college that was established in 1959 to serve the students of Madison and the five nearby counties of Hamilton, Jefferson, Lafayette, Taylor, and Suwannee. Attendance has grown dramatically in the past few years from about 600 students to over 800 students. This is likely a factor of the current recession but with the trend in community colleges starting to offer four year degrees, the NFCC Campus will likely need to expand to accommodate the future changes in education. This creates a need to develop a masterplan to address and prevent the issues that will arise from expansion and development as well as to try to correct issues that already exist.

The NFCC campus is rich in natural and cultural resources with several lakes and mixed hardwood and wetland forest found on site. It is a very unique place to put a school but fails to use these resources to their full advantage. The campus generally lacks a sense of place as the architecture looks very generic and outdated. The original part of the main campus was designed with some level of uniformity, connectivity, and open space in mind, but as the campus expanded much of this concept was lost as the newer buildings were fragmented by roads and parking lots. The buildings seem to be placed without a lot of thought as to alignments and the outdoor spaces lack function and connectivity. There is no sense of arrival to the campus as the entrances are not well defined. Stormwater is an issue that needs to be dealt with due to the low lying nature of the site and the existing environment creates an excellent opportunity for sustainable and interpretive stormwater design.

Project Introduction

Project Location



Project Location:

North Florida Community College
325 NW Turner Davis Drive
Madison, Florida 32340

Mission Statement

The main goal of the project is to bring about a sense of place to the campus while protecting and enhancing the existing natural and cultural resources found on site with regard to addressing future growth management.

The main focus of the project will be to determine the best possible solutions for growth management and expansion of the campus with regards to connectivity through pedestrian and vehicular circulation patterns. Stormwater management will play a crucial role in determining these outcomes due to the hydrological and topographical influences of the site and surrounding context. .A careful examination of the sites existing conditions will reveal opportunities and constraints that provide ideas for implementing both functional and attractive alternatives to the current problems at hand.

It is my personal belief that the campus is located on a very unique site that does not take full advantage of it's natural features. With the present knowledge available in stormwater management and the evolving change in policy and guidelines, I believe the campus is in a unique situation for implementing interpretive design strategies that can be used as an educational tool to explain to students and the community the importance of stormwater. It may also be a great resource as an outdoor laboratory for the sciences and other curriculum to study. These solutions will be put into a masterplan that addresses them in a sustainable manner for future reference and guidelines.

I have chosen the NFCC campus as my capstone project because I got to spend some time on the site by working with the school at their satellite campus, Green Industries Institute during my internship. Being in a rural setting was new to me and I began to see the complexities and uniqueness that exists in these areas, especially with education facilities. I noticed the issues that existed on site and saw an opportunity for a masterplan that tries to resolve them. My interests in landscape architecture are geared towards revitalization and stormwater management and I see this campus as a very unique site that would accommodate these interests.

Image. http://www.southernenvironment.org/about/top_10_2009/johns_island/

Project Introduction

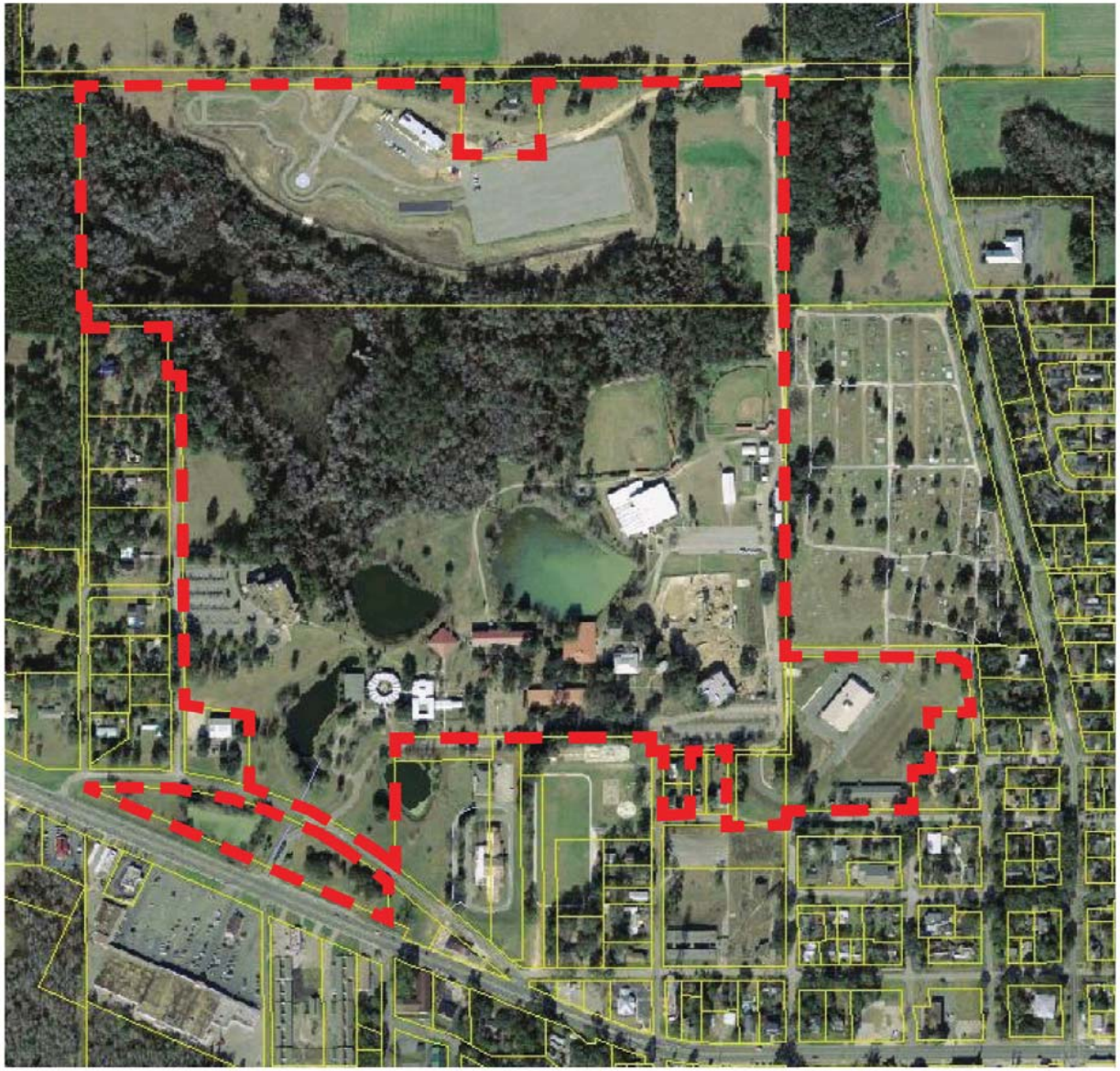
Site Description:

The site of the campus is approximately 165 acres in size with four natural lakes wrapping around a large portion of the main campus. A large open space connects several buildings creating an inner campus. Twenty acres of hardwood and wetland hammock with a lake and a spring fed stream also exists on site. Within it is the Ladell Brothers Outdoor Environmental Center with over 1.5 miles of trails, a picnic area, and a boardwalk crossing over marshland. The Environmental center is part of The Great Birding Trail.

The campus has a large setback of almost 800 feet from Highway. 90 with a long, winding road leading to the administration buildings. There is a road network that goes around the south and west perimeter with four separate parking lots connected to it. On-Street parking with 45 and 90 degree spaces also occurs along portions of the roadway. A total of five entrances to the campus exist.

The classroom buildings of the main campus area have an institutional architectural style similar to an old K-12 school that is very outdated. They are generally one story in height with outdoor breezeways. One of the buildings is partially two stories in height due to the topography.

Inventory of the buildings of the main campus include two administration buildings with one having an interesting courtyard space in the center. There is an IT building, library, student center, five academic buildings, and a gymnasium (recently remodeled). Spread away from the inner campus is the Career and Technical Education Center, a recently built Science Learning Center, and an auditorium to hold school and local functions.



0 100 200 400

Scale: 1" = 200'

Project Introduction

Context Description

The site of the school is located within a valley surrounded by sloping terrain to the east and west of the campus. A huge stormwater retention pond exists just west of the campus at the bottom of a large hill. A major highway, U.S. Highway 90 runs along the south entrance of the campus. This connects a rural part of Madison on the east to the downtown section of the City located to the west. Private apartments offering student housing are located southeast of the campus while an older looking shopping center with a grocery store as well as smaller retail stores are located across the street to the south of the campus.

Several fast-food restaurants and a southern buffet style restaurant are also within this district. To the west of the campus is a mix of land uses from small sprawling businesses to residential housing, apartments and then the downtown corridor which has the character of a small southern town laid out in a grid pattern with on-street parking with spaces having 45 degree angles. Directly north of the hardwood hammock on campus is the Public Safety Academy which trains police and corrections officers as well as firefighters. Mixed land uses continue with much of it appearing to be agricultural land and patches of woodland vegetation. Agriculture encompasses the surroundings of the developed land and several natural water bodies appear throughout the county.

NFCC Campus

Ladell Brothers Outdoor Environmental Center

Urban, Downtown Area

0 850' 1700' 3400' 5100'

Scale: 1" = 1700'

Program, Goals and Objectives, and User Analysis

Program Development.....page 10

Goals and Objectives..... .page 11

User Analysis.....page 12

Program Development

Stormwater Management Plan

- Retention/Detention Ponds
- Wetlands/Filtration
- Outdoor Learning Spaces/Laboratory

Growth Management and Expansion Plan

- Academic Buildings
- Administration Buildings
- Sports and Recreation

Connectivity

- Pedestrian Circulation
- Vehicular Circulation and Parking
- Open Space

Campus Identity

- Gateways/entrances
- Architecture
- Landscaping

Goals and Objectives

Manage stormwater through creative, sustainable, and interpretive practices.

- Identify the path and sources of stormwater runoff and design a functional and attractive system that integrates a combination of features such as rain gardens, swales, bio-filtration, and habitat pools that cleans the water before it reaches the lakes and stream.
- Use native plant material within the stormwater system to clean the water through natural processes.
- Highlight as a design feature that educates students and the community about the importance of managing stormwater.
- Create a wetland that acts as a living outdoor laboratory for students to learn about biology, ecology, and chemistry.

Preserve and enhance existing natural resources on site.

- Place vegetative buffers of native plants around water bodies
- Prevent sedimentation and both point and non-point source pollution from reaching the water bodies and other delicate resources such as the hardwood hammock by managing and cleaning stormwater before it reaches these resources.
- Locate appropriate areas of the lakes to open up the shoreline edge for users to gain up close access to the water.
- Analyze the current walking trail system within the Ladell Brothers Environmental Center and determine if the system could be better modified to pre serve existing ecosystems or enhance the user experience within the hammock.

Improve and enhance pedestrian and vehicular circulation as well as connectivity throughout the campus.

- Use topography and natural features to create vistas and enhance the user experience for both pedestrians and vehicular travel throughout the site.
- Improve way-finding with uniform signage and open view-sheds with functional circulation patterns.
- Make vehicular circulation and parking more functional while adding a scenic element to it through landscape planting and road alignment that reveals view-sheds of lakes and other landmark features.

Address future expansion and management.

- Identify land having the highest suitabilities for conservation, placement of infrastructure, and structures while offering unique situations for defining and framing spaces.

User Analysis

User Groups:

- Students
  - 18-25 Younger Generation
  - 26-40 and beyond. Workforce Development
  - Athletes
- Faculty
- Administration personnel
- Maintenance personnel
  - Building Maintenance
  - Landscape Maintenance
- Visitors (All age groups)
  - Individuals or small groups
  - Large groups (Events at Art gallery, Auditorium, or sports related
- Persons with disabilities
- Birdwatchers (Great Florida Birding Trail)
- Local residents for hiking or jogging

Scales of Concern:

- Surrounding Context
- Site of NFCC Campus
- Individual Areas of Campus
- Human Scale (Details)

Stakeholders:

- North Florida Community College
- State of Florida

Existing Conditions

Unique Site Features.....page 14

Architecture Styles of the NFCC Campus..... page 15

Building Inventory and Locations.....page 16

Current Methods of Stormwater Management..... page 17

Unique Site Features

Several unique features of the property enhance the visual experience and bring about a sense of place to the campus. These range from large expanses of green space filled with mature trees to the network of lakes that form the framework for the layout of the site. Some of the existing buildings such as the Student Center pictured below take full advantage of these spectacular viewsheds while others could benefit more.

Open space at edge of inner campus

View of lake from behind Student Center

Open space within inner campus.

14

Architecture Styles of the NFCC Campus

There are multiple architecture styles that exist on the campus. Some uniformity and common elements exist in the older styles while the more modern styles tend to have less in common with the original campus. The Science building and the Van H. Priest Auditorium are the newest additions to the campus.

Student Center

Academic Building

Art Gallery

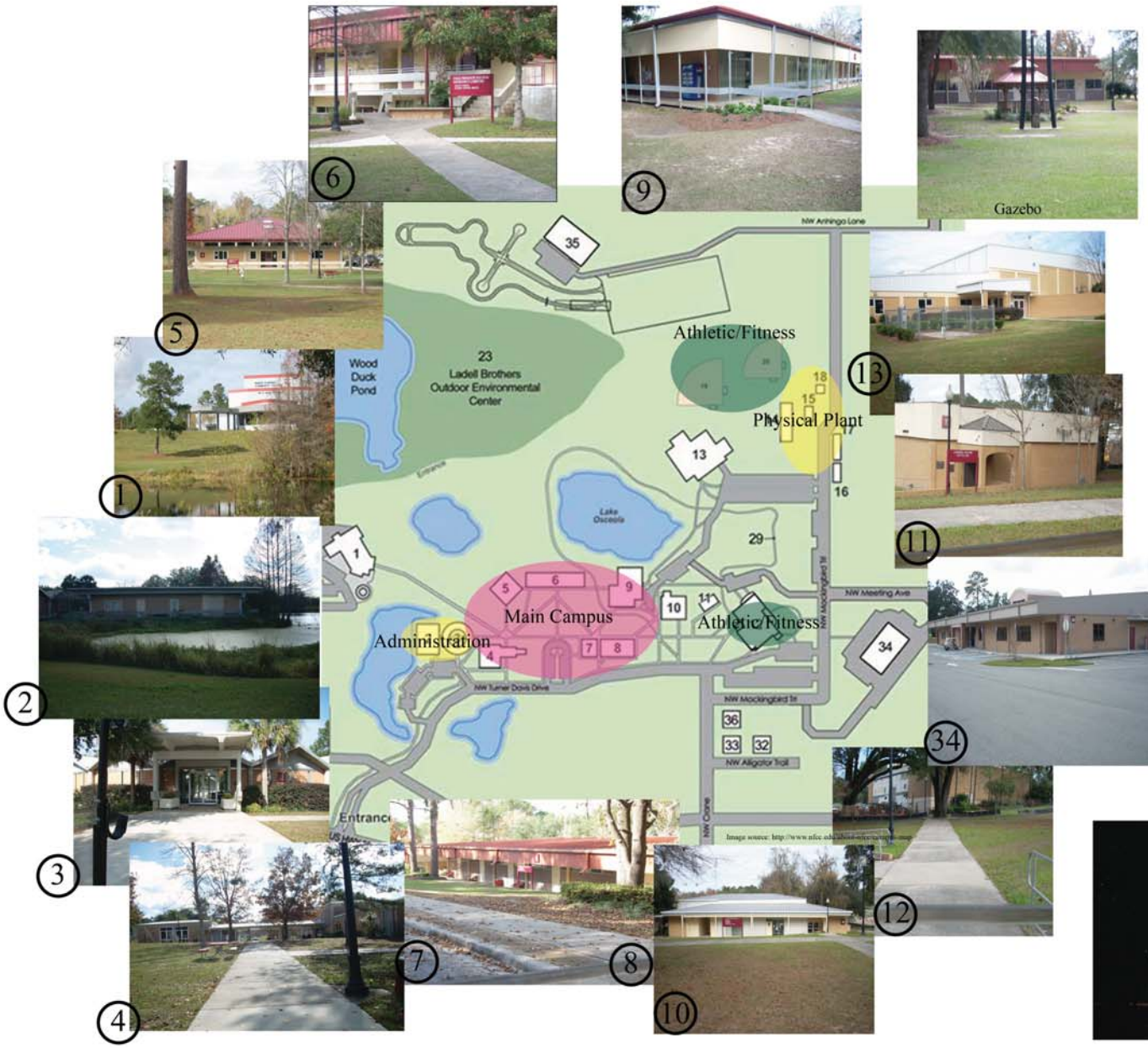
Science Building

Career and Technical Education Center

Administration Building

Van H. Priest Auditorium

Existing Conditions



Building Inventory and Locations

NFCC CAMPUS MAP

1. Van H. Priest Auditorium
2. Administrative Services Building
3. Walter L. Bishop Administration Building
4. Marshall Hamilton Library
5. Technology Center
6. College Preparatory Education /Mathematics Classrooms
7. Business Education Building
8. General Classrooms Building
9. Student Center
10. Fine Arts Building
11. Hardee Center for the Arts
12. Colin P. Kelly Fitness Center
13. Career and Technical Education Center
14. Warehouse
15. Greenhouse
16. Testing Center
17. Maintenance Building
18. Warehouse
19. Sentinel Baseball Field
20. Frank Cantey Softball Field
23. Ladell Brothers Outdoor Environmental Center
29. Fitness Walking Trail
32. College Advancement / Artist Series
33. University Programs / Saint Leo University Offices
34. Morris G. Steen, Jr. Science Learning Center
35. Public Safety Academy
36. Government Relations Office

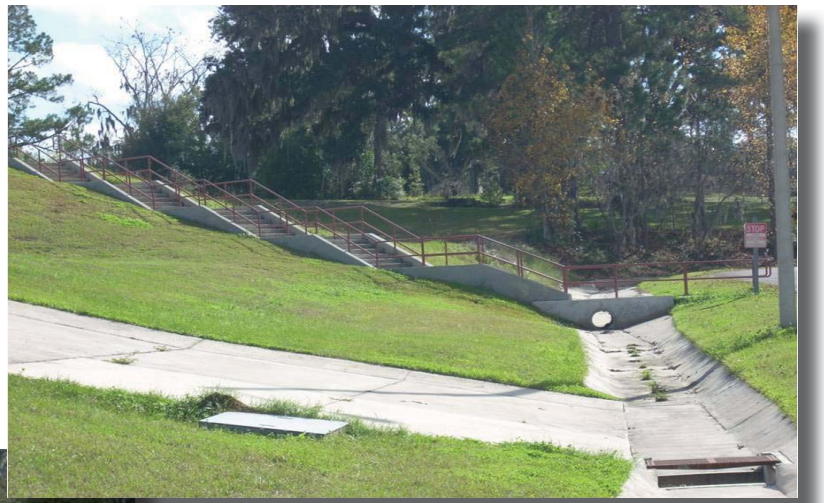
Text source: http://www.nfcc.edu/about-nfcc/campus-map

Clock/Bell Tower

NTS

Current Methods for Stormwater Management

Several methods of stormwater management occur on the campus. These include retention ponds surrounded by fences, concrete swales, and large concrete spillways. A long, straight concrete swale similar to the one featured in the picture to the right runs directly through part of the main campus. These produce unattractive elements that could be used more creatively to enhance the visual quality of the campus.



Concrete swale and spillway next to Science Building

Drainage basin hidden by Sidewalk and poured concrete retaining wall to handle water detention during big rain events.

Concrete swale next to Art Building carries water from parking lot toward lake.

Context Analysis

Landuse Map.....page 19

Regional Watershed, Topography, and Wetlands.....page 20

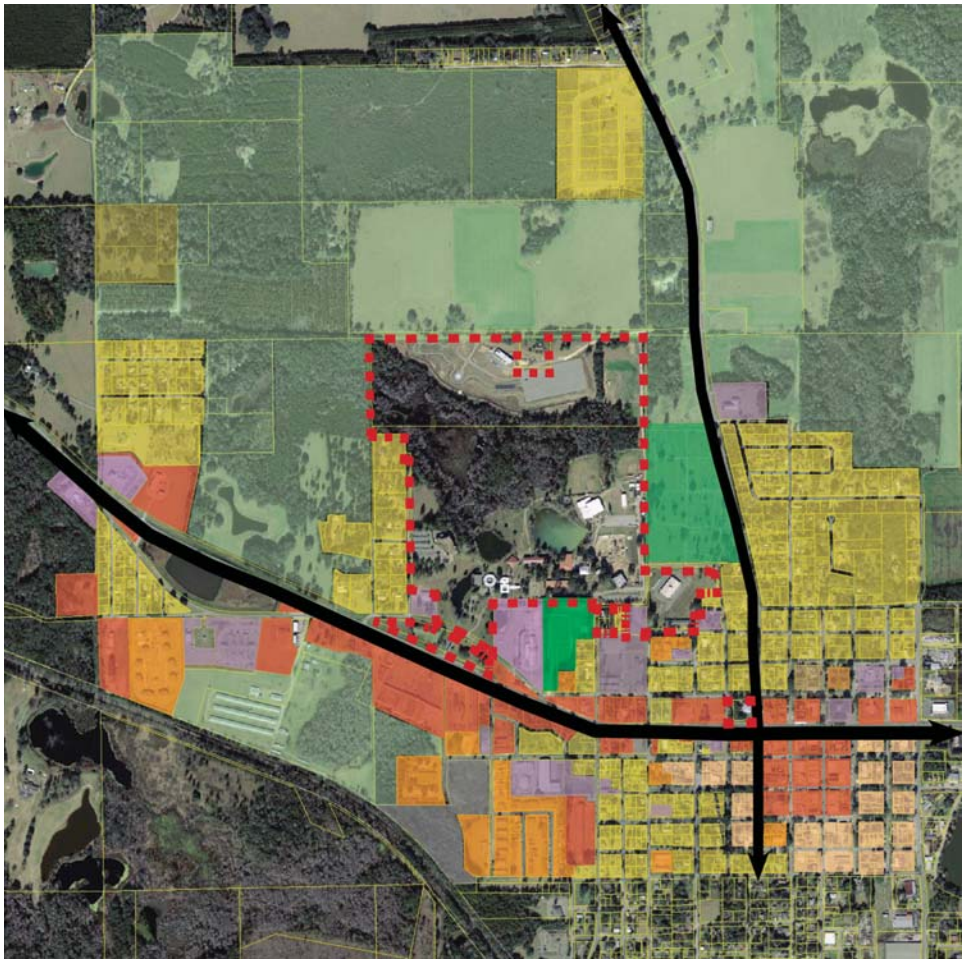
Context, Watershed, and Drainage Patterns.....page 21

Context Analysis

Madison County is historically known for its agriculture and timber which can be seen today surroundihng a large portion of the NFCC campus. Existing green space currently borders the campus with a cemetery on the east side of the property and a community park on the south side. The County Agricultural Extension Agency (Institutional Color) is located on the southern edge of campus next to the park and a public library borders the southwest side of the property.

Several other land uses seen on the map include commercial properties that stretch along the major highway. Both large and small patches of residential and multi-family can be seen throughout the land-use map.

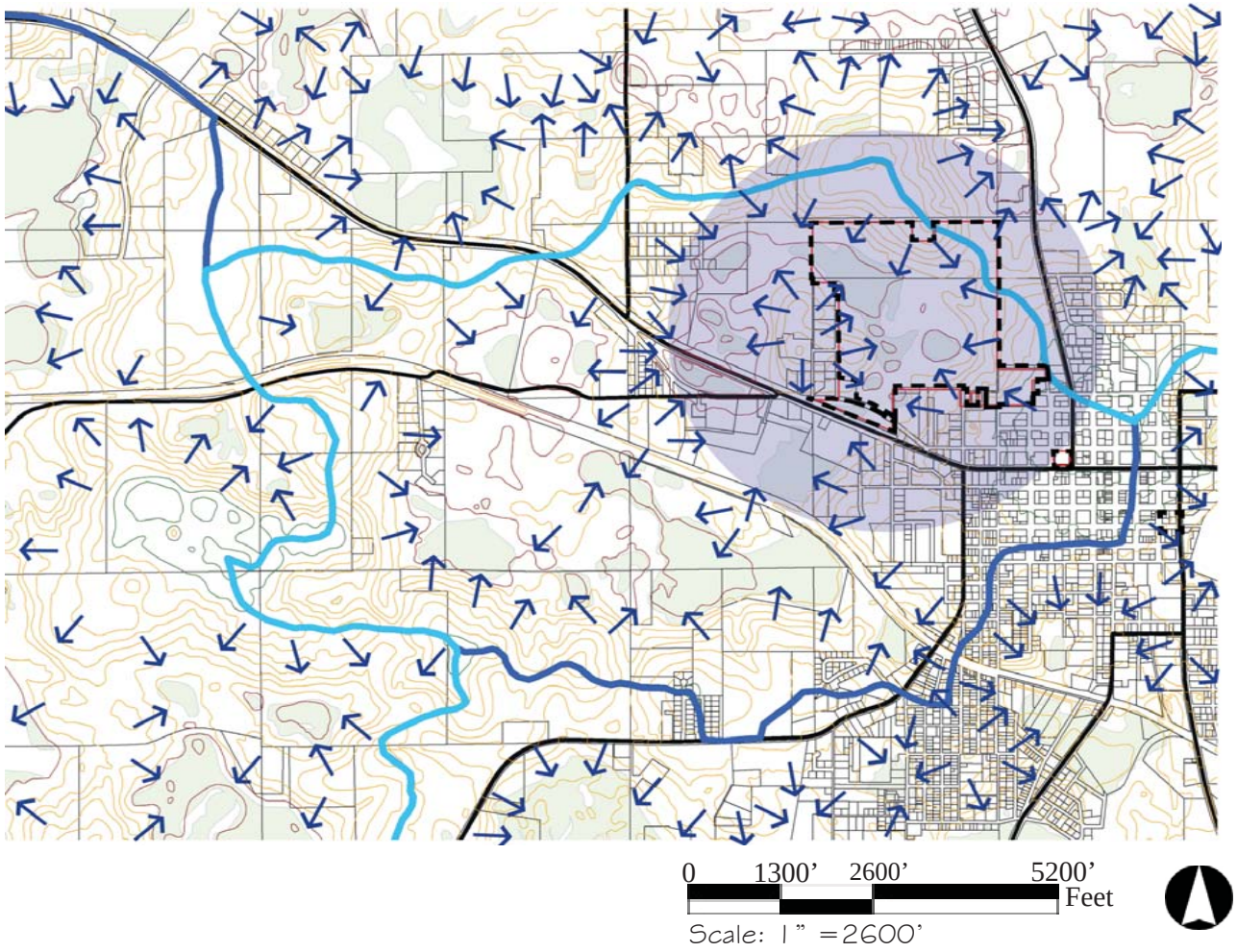
Landuse Map



Regional Watershed, Topography, and Wetlands

Because stormwater is such a major issue on the site the regional watershed was examined to clarify exactly where it is located as well as any drainage basins that might affect the site. This information helped determine the area of concern which is seen as the purple bubble on the map.

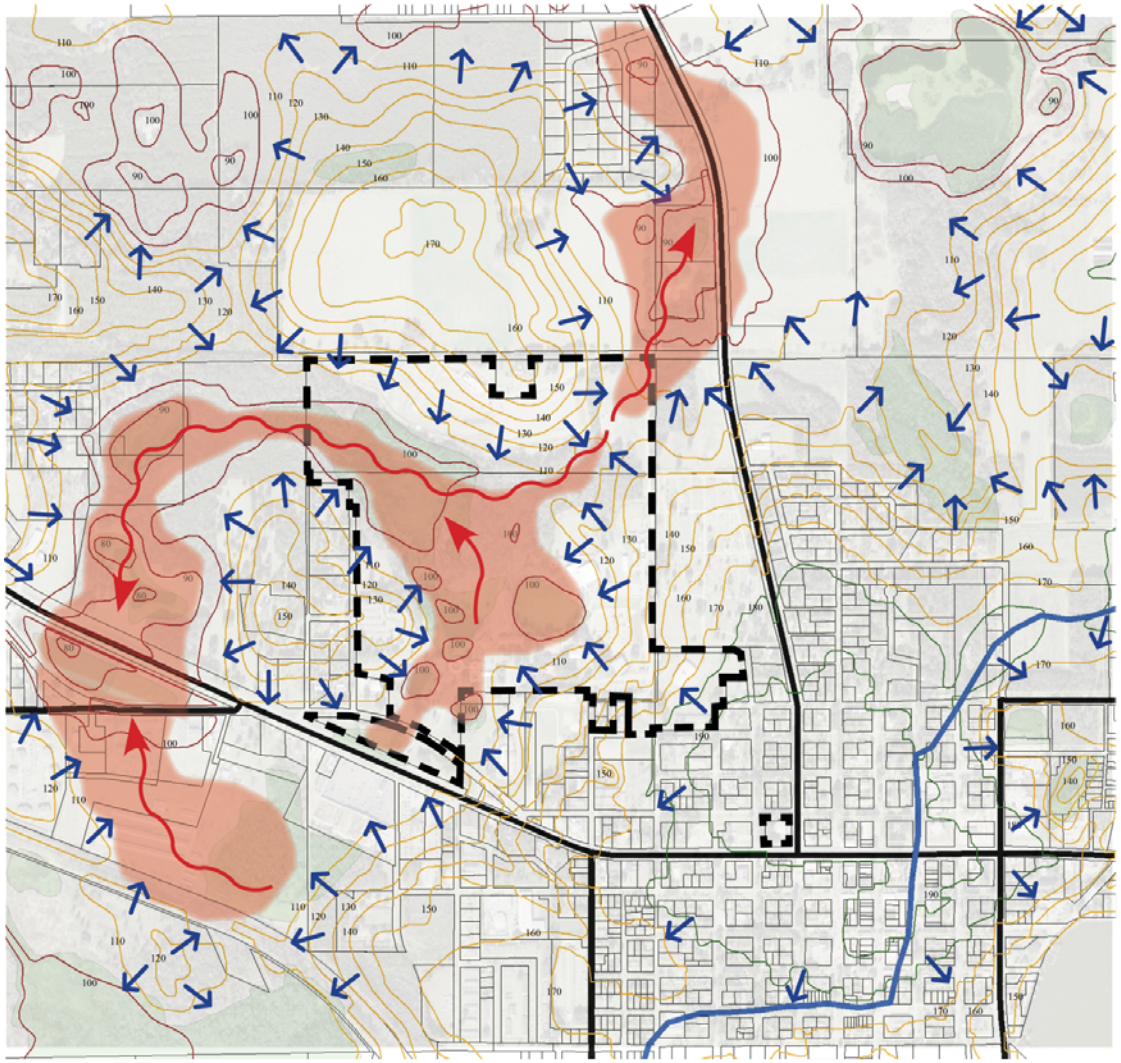
The map also describes the elevation changes of the area as well as where wetlands are located.



Context Watershed and Drainage Patterns

The watershed was examined at the context scale to determine the flow of water through the site.

There is a 110 foot elevation changes in this area ranging from 190 feet to 80 feet. The red color indicate the low areas of the valleys and suggests the paths that water moves through them as well as likely aquifer recharge areas, especially in the southwest corner.



Site Analysis

FEMA Floodplain 2010..... page 23

Soil Types and Drainage Properties ..... page 24

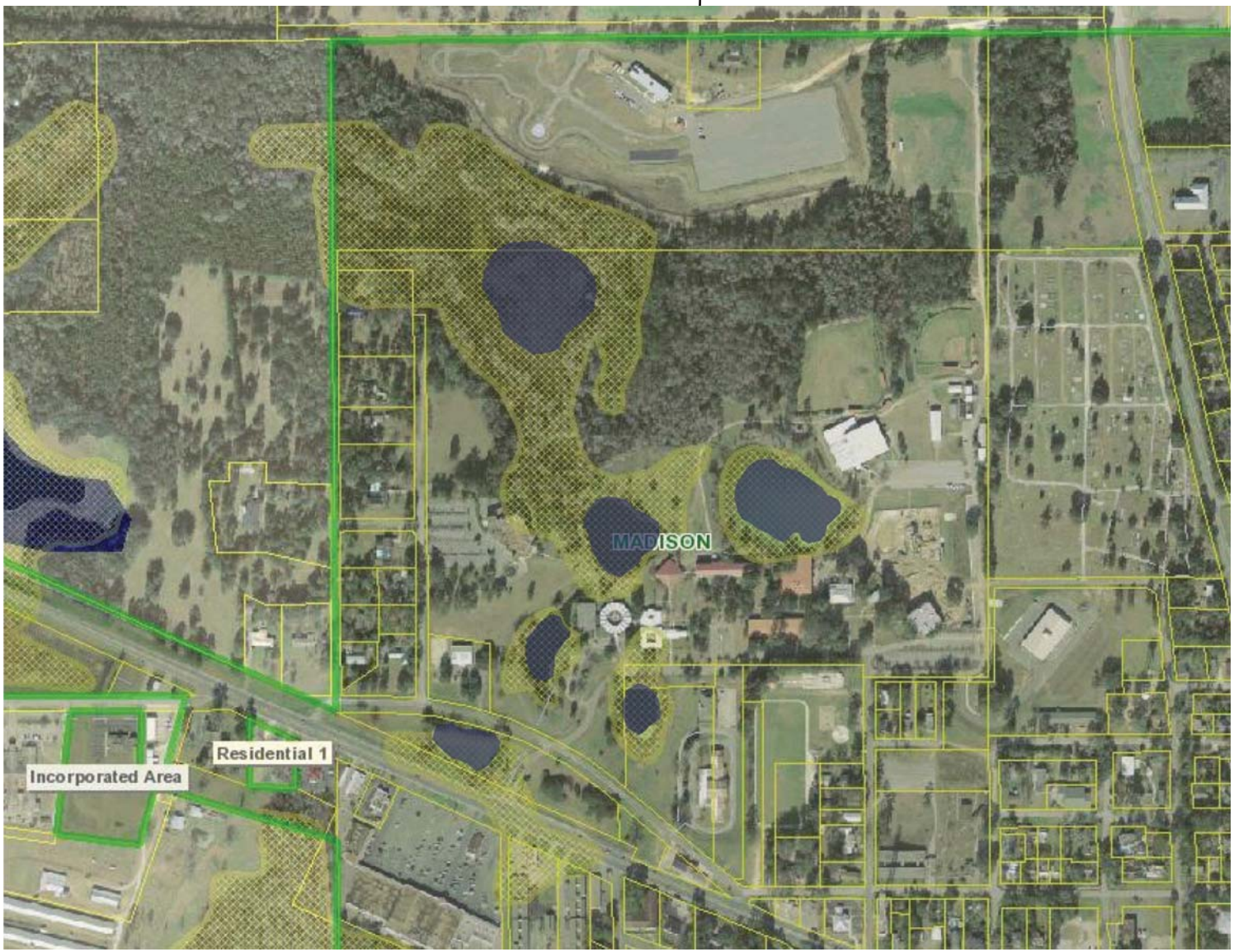
Vegetation ..... page 25

Soil Suitabilities..... page 26

Vehicular Circulation ..... page 27

Pedestrian Circulation ..... page 28

FEMA Floodplain 2010



Legend

- FEMA Floodplain 2010
- Lakes
- Madison City Boundary
- Property Parcels
- NFCC Property Boundary

The 2010 FEMA Floodplain map shows the floodplain covering the same areas as the wetlands on the water-shed maps.

The floodplain can be seen bordering a large portion of the north and west sides of the main campus area.

0 300’ 600’ 1200’

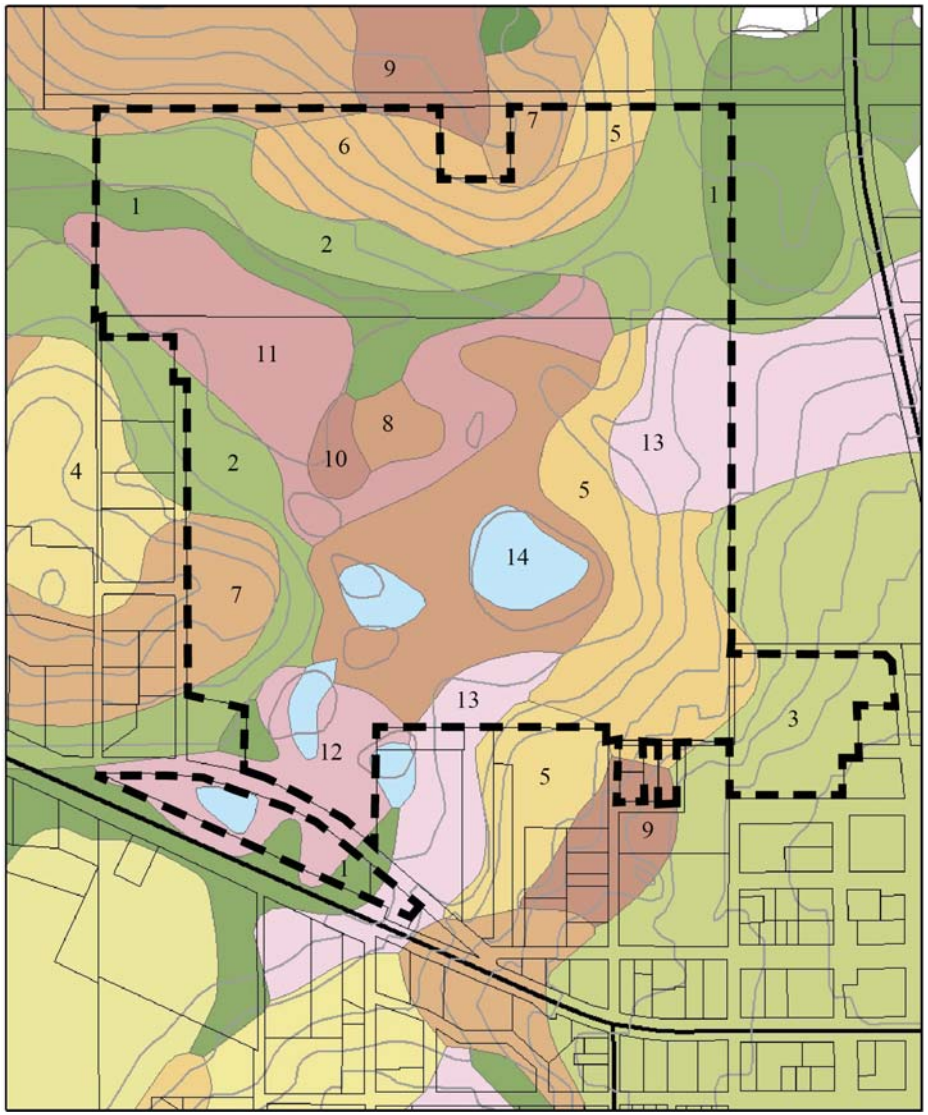
Scale: 1” =600’

Soil Types and Drainage Properties

Soils found on the site and context were looked at to help determine the drainage properties and slopes of the area. This was necessary to begin looking at locations that would be most suitable for future expansion and growth management of the campus.

Once the existing soils were determined, a metric was created using ARC GIS and the USDA Soil Survey to create suitability maps that show areas with the highest and lowest suitabilities for both site-structural development and recreational development.

Site-structural development is based on locating structures such as buildings, parking lots, and road networks. Recreational development is based on locating trails, sports fields, campgrounds, and picnic areas.



LEGEND

- Property Parcels
- Major Roads
- Proberty Boundary

Soils Descriptions

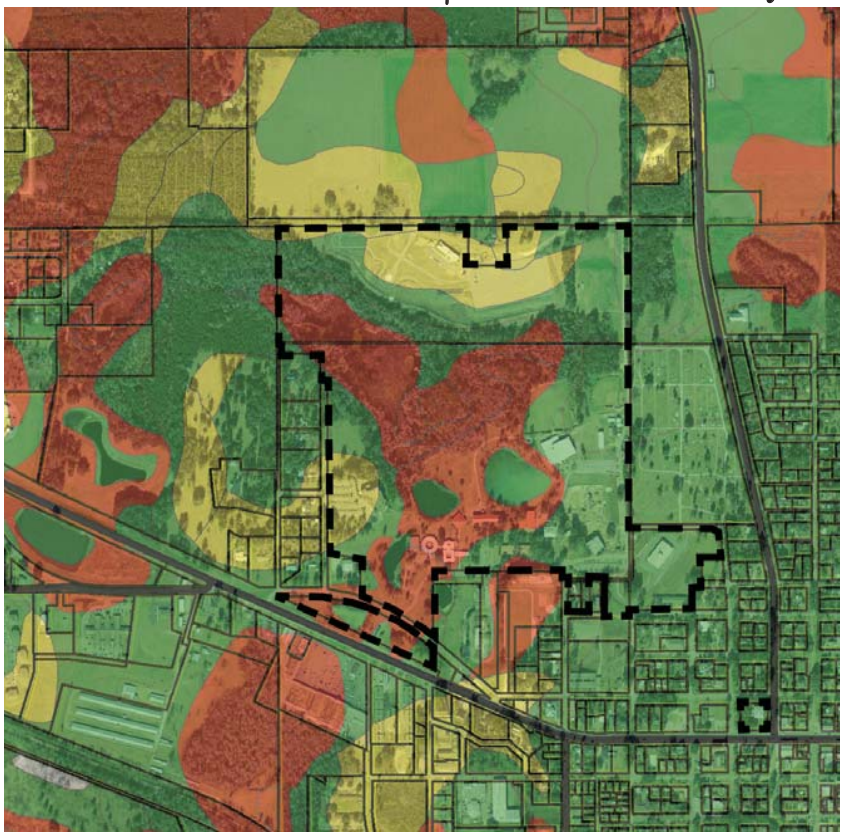
1. **Albany Sand**, *0-5 % Slopes, Somewat Poorly Drained*
2. **Blanton Sand**, *0-5 % Slopes, Moderately Well Drained*
3. **Bonifay Fine Sand**, *0-5 % Slopes, Well Drained*
4. **Fuquay Sand**, *2-5 % Slopes, Well Drained*
5. **Lovett Sand**, *5-8 % Slopes, Moderately Well Drained*
6. **Lucy Sand**, *5-8 % Slopes, Well Drained*
7. **Nankin Loamy Sand**, *5-8 % Slopes, Well Drained*
8. **Ocilla Sand**, *0-5 % Slopes, Somewhat Poorly Drained*
9. **Orangeburg Loamy Sand**, *2-5 % Slopes,Well Drained, Prime Farmland*
10. **Pelham Sand**, *Nearly Level, Poorly Drained*
11. **Plummer and Surrency Soils**, *Nearly Level, Depressional, Very Poorly Drained*
12. **Plummer Sand**, *Nearly Level, Poorly Drained*
13. **Troupe Sand**, *0-5 % Slopes, Somewat Excessivly Drained*
14. **Water**

Soil Suitabilities

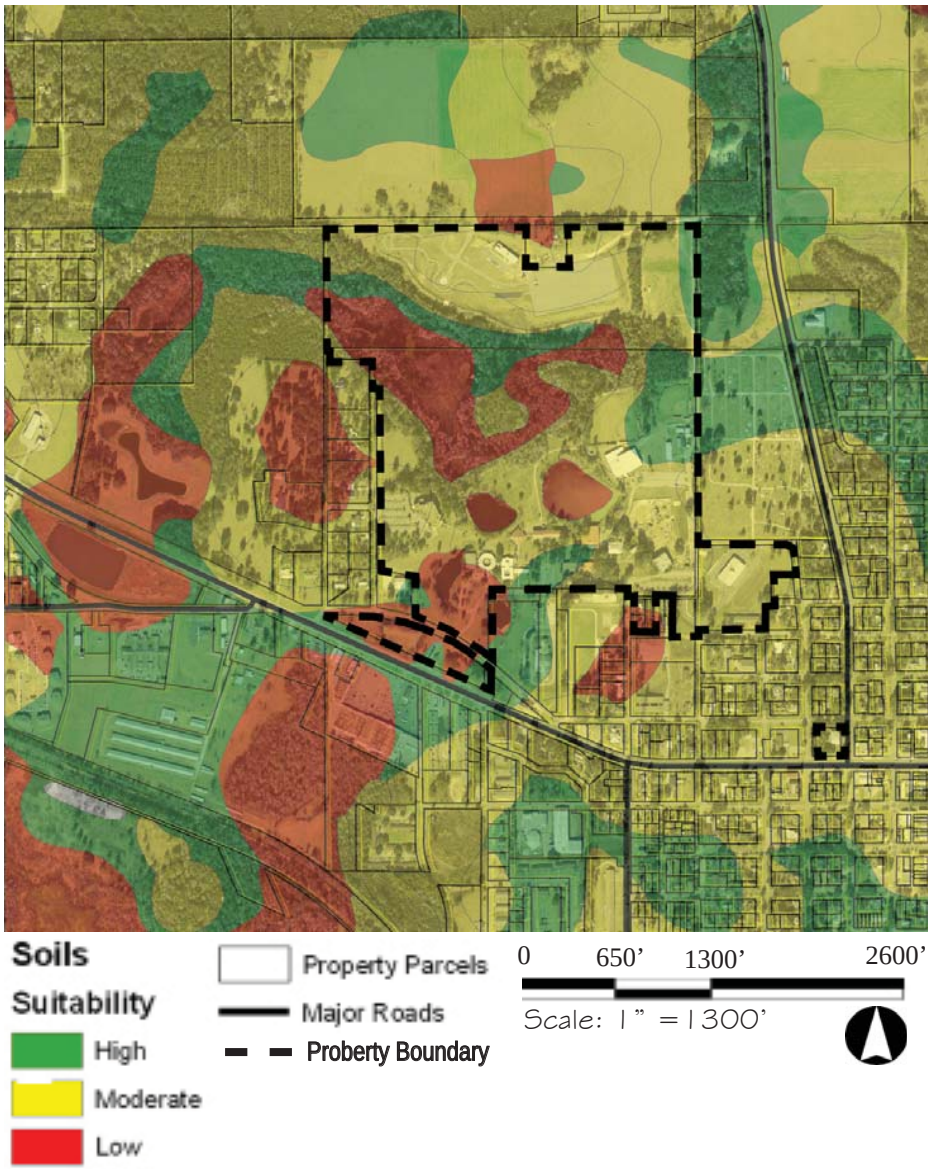
The structural development suitability graphic shows that the majority of the campus infrastructure and remaining land exists on land with only moderate suitabilities. The Maintenance facility and only a small part of the main campus were located in areas with high suitabilities.

The recreation suitability graphic shows that all of the existing sports fields such as the baseball and softball field as well as the tennis courts and open green space were located on soils with the highest suitabilities.

Recreational Development Suitability



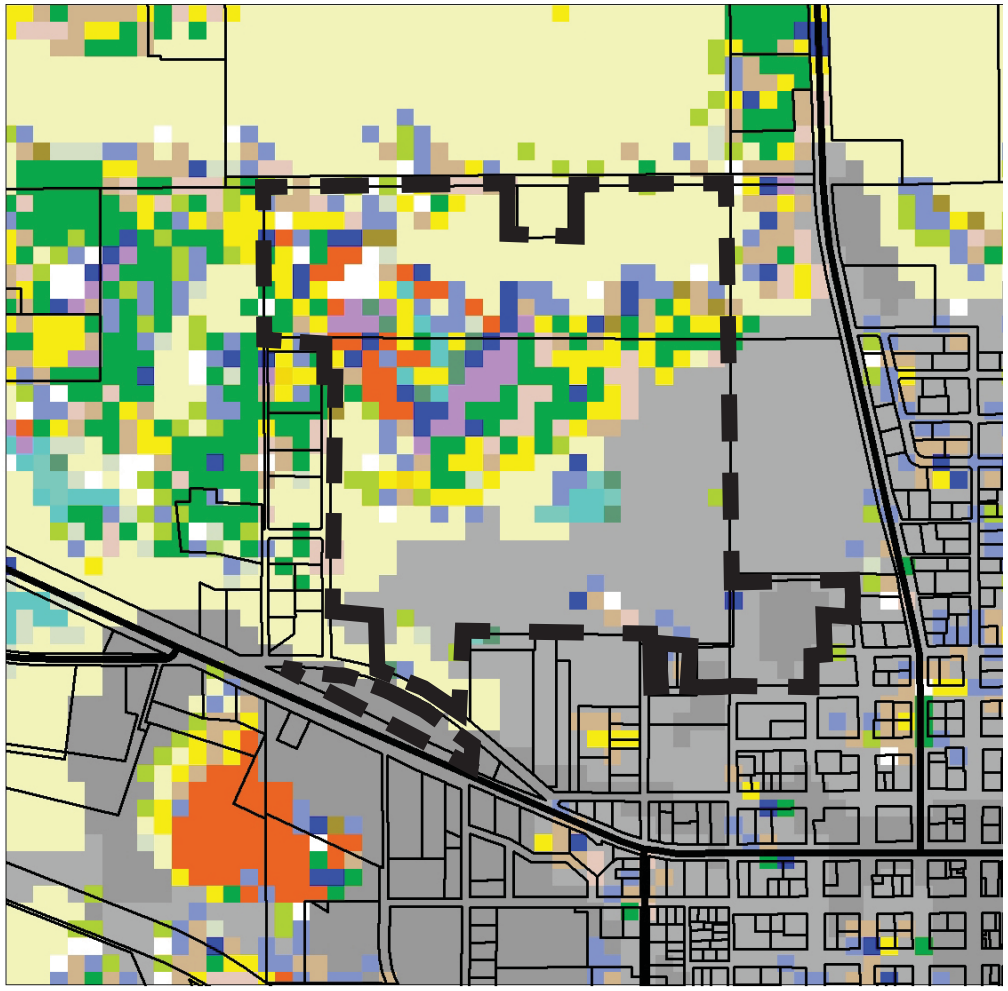
Structural Development Suitability



Vegetation

Several ecosystems as well as mature trees exist on the campus. A twenty acre hardwood and wetland hammock divides the property. This is seen on the map as a colorful band stretching through the property boundary. Within this hammock is a variety of ecosystems including swamp forest, cypress, mesic-xeric mixed pine and oak, sandhill, and several others.

Many mature trees can also be found on the main campus. Several specimens of live oak and laurel oak as well as tulip poplars, cypress, and sycamores create a beautiful canopy and much needed shade.

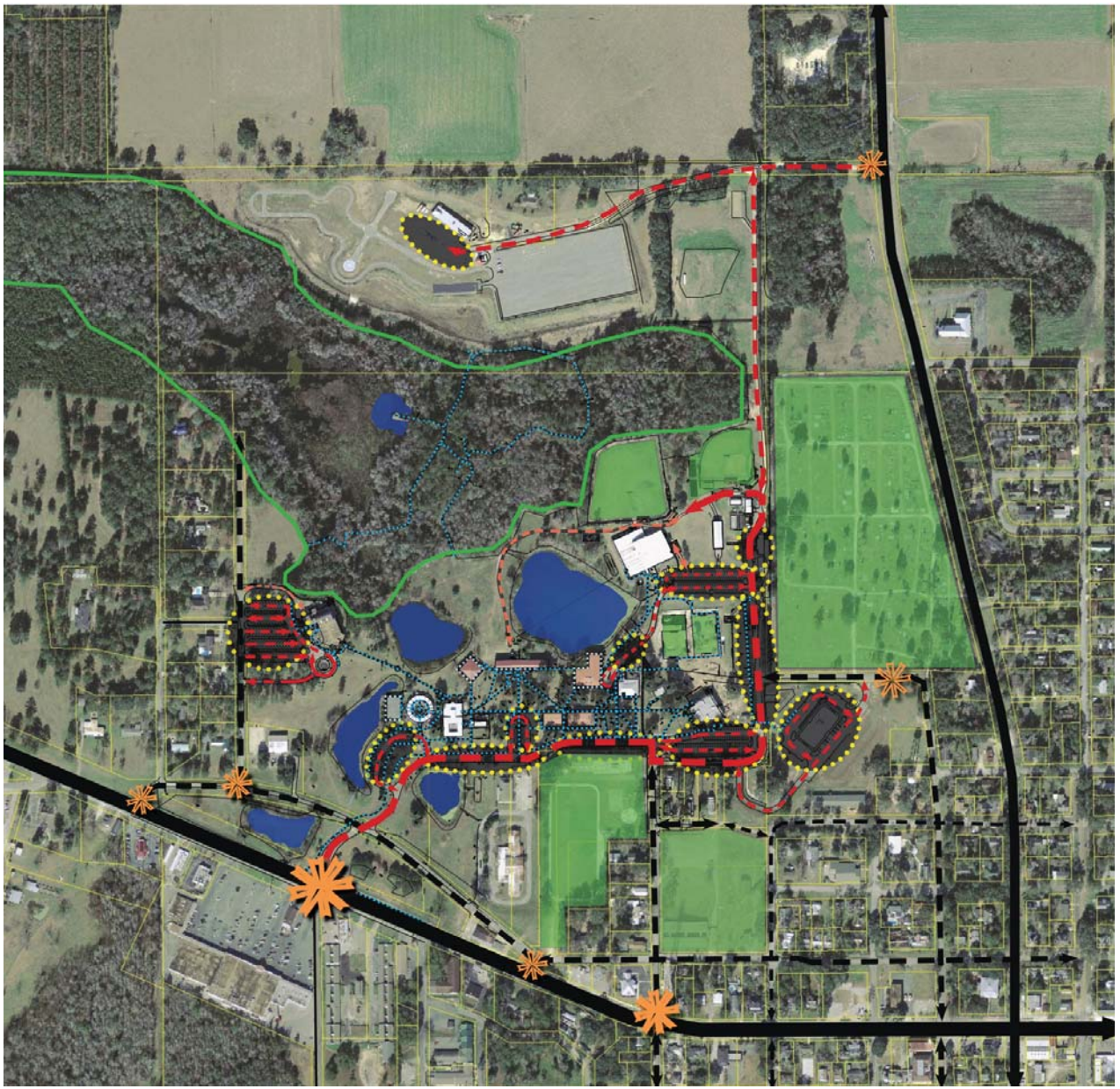


Legend

- Madison Property Parcels
- Major Roads
- NFCC Property Boundary
- Open Water
- Agriculture
- Bay/Gum/Cypress Ecological Complex
- Xeric-Mesic Mixed Pine/Oak Forest Ecological Complex
- Mesic-Hydric Pine Forest Composition Group
- Swamp Forest Ecological Complex
- Cypress Forest Compositional Group
- Mixed Evergreen/Cold-deciduous Hardwood Forest
- Sandhill Ecological Complex
- Broad-leaved Evergreen and Mixed Evergreen/Cold-deciduous
- Water Lily or Floating Leaved Vegetaion
- Xeric-mesic Live Oak Ecological Complex
- Forb Emergent Marsh
- Water Lily or Floating Leaved Vegetaion
- Urban/Residential

Site Analysis

Vehicular Circulation



Legend

- Arterial Roads
- Connector Roads
- Primary Vehicle Route
- Parking Lot Circulation
- Maintenance Roads
- Parking Lots
- Athletic Recreation, Parks, Green Space
- Water
- Hardwood/wetland Hammock
- Pedestrian Circulation
- Pedestrian Circulation Under Buildings
- Entrances/Gateways

0 375' 750' 1500'

Scale: 1" =750' feet

Pedestrian Circulation

Legend

- Athletic Recreation, Parks, Green Space
- Water
- Hardwood/wetland Hammock
- Pedestrian Circulation
- Pedestrian Circulation Under Buildings
- Pedestrian Routes With Major Connections
- Pedestrian Gathering Locations
- Trailheads
- Parking Lots

0 200’ 400’ 800’

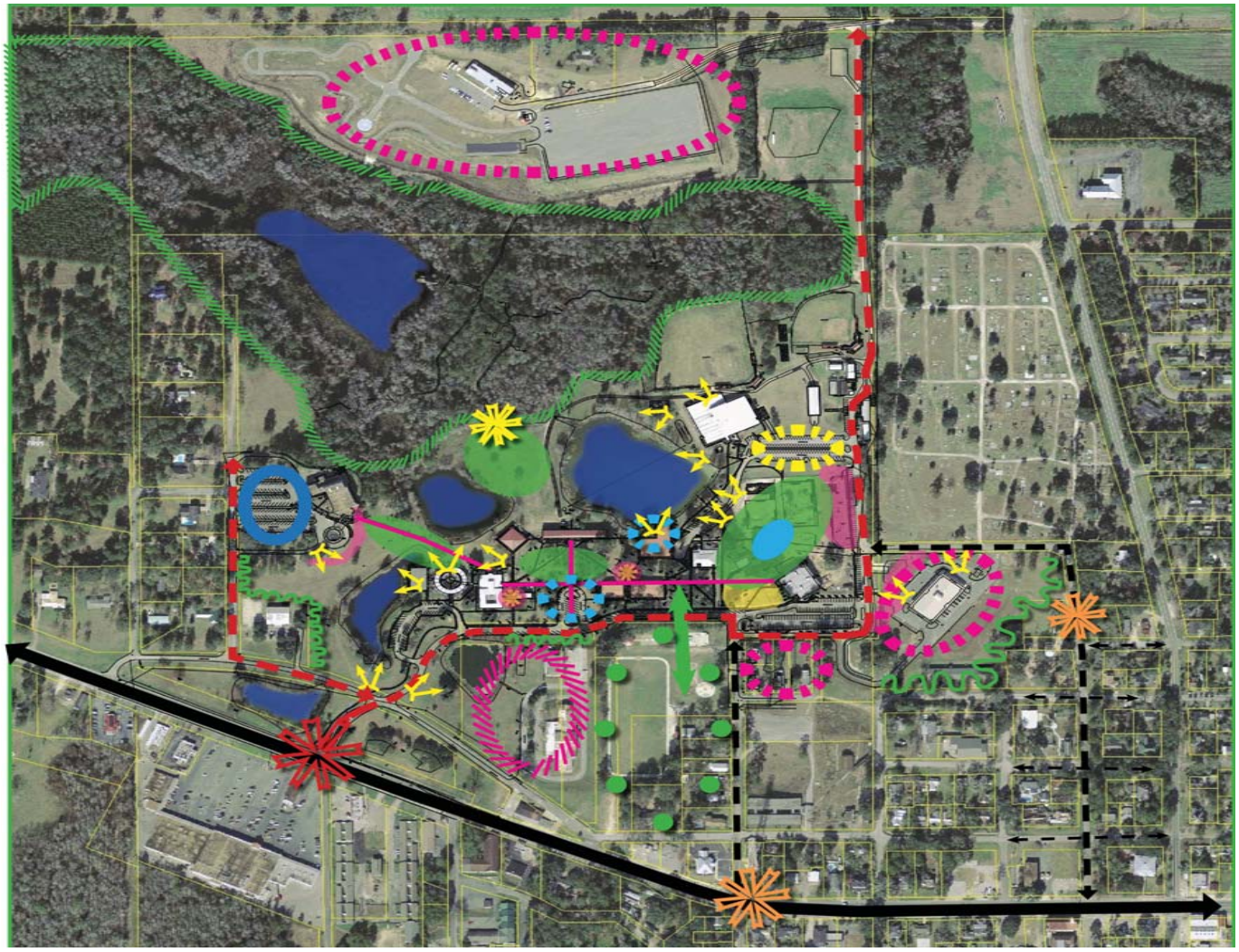
Scale: 1” =400’ feet

Site Synthesis

Synthesis..... page 30

Conclusion ..... page 31

Site Synthesis



Conclusion

Through my analysis of the site and context I was able to determine that the best location for expanding the campus exists within the existing property boundary. The primary vehicle route through campus runs along the edge of the property and already has some good alignments as to views of the lakes and some large specimen trees. Expansion of parking areas is an issue without locating them on adjacent properties which are county owned and therefore may be easy to acquire.

The baseball and softball fields are currently not being used but because they exist they should remain where they are in the event that NFCC decides to reinstate their sports program in the future. The Public Safety Training Academy located to the north of campus is already fragmented by the hardwood hammock forest as it should be. The Ladell Brothers Outdoor Environmental Center located in the hardwood hammock and already has some good trail systems and takes advantage of some unique views. It utilizes good connections to the campus and should only need minor modifications to maximize its function and connectivity.

When studying the floodplain and topography of the site and seeing the 45 foot elevation change on the east side of the campus, it is easy to see why the site was developed the way it is. With this said there still remains several opportunities to enhance and create connections to the natural features and greenspace while making it a unique and productive learning environment as well.

Opportunities:

Offer views of natural areas and greenspace from all existing and proposed buildings.

Connect the county park and cemetery as adjoining greenspace to the campus.

Relocate the maintenance facility to a new location as the land it currently sits on is prime for the campus expansion.

Relocate parking lot that is currently located in a prime location of the main campus and create a strong entrance and axis that defines that area.

Constraints:

Expansion of parking within the campus property boundary is very unlikely without disrupting the natural resources and greenspace areas or without expanding into the adjacent parcels.

Topography will create challenges as far as site development and stormwater treatment is concerned.

Some of the newer buildings have been fragmented from the main campus and it will likely be challenging to try to reconnect them.

Concept Development

Concept 1.....page 33

Concept 2 ..... page 34

Concept 1

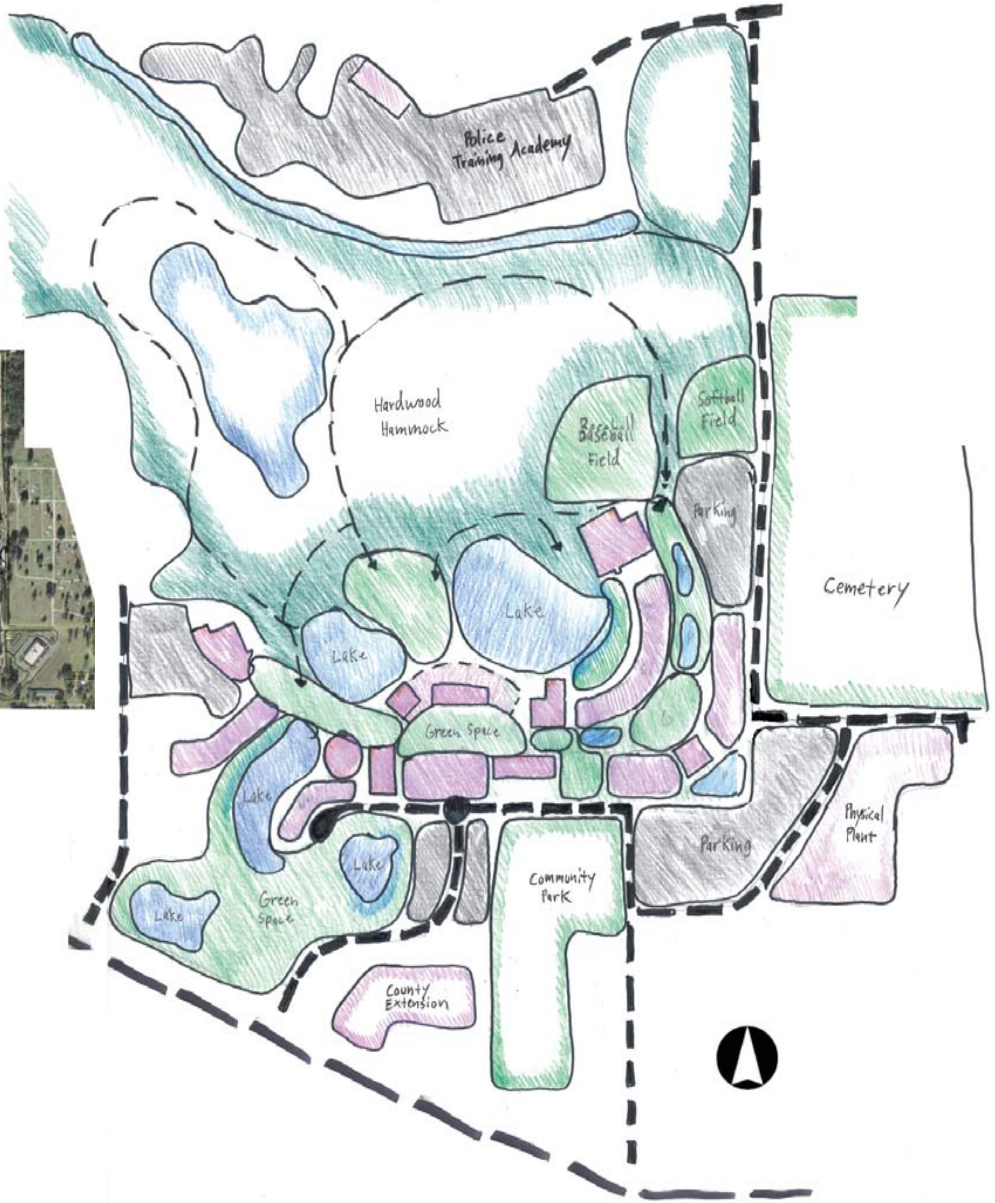
In this concept the maintenance facility was relocated to the northeast corner of the property next to the Public Safety Academy where it would be hidden by the hardwood hammock. The parking area surrounding the science building was removed and a complex of buildings was created in the southwest corner of campus below the cemetery. Much of the road network remains the same throughout this concept. Many of the parking lots have been relocated slightly with the exception of the one that was at the center of the main campus. It has been moved south toward the main entrance behind the lake.

Much of the main campus remains the same with a few exceptions. A building was placed where the parking lot was removed and one of the administration buildings extends over a narrow band of water. The proposed buildings on the eastern side shaped like H's have courtyards within them to create spaces unique to those buildings. The buildings also work to frame the existing main campus. Greenspace connects the campus and community park while being broken up by the buildings and road to create unique areas of the campus.

Concept 2

Part of the road network at the main entrance to the campus was removed in this concept to create less fragmentation of the greenspace at the entrance. The Agriculture Extension Agency was moved closer to the highway so that a parking lot could be placed where it originally existed. The entrance road was realigned to create a hierarchal sense of arrival at the main campus with an iconic building located at the end of it.

Greenspace connects the campus through a more linear pattern in this concept than the previous. Existing lakes and proposed stormwater ponds break up the greenspace instead of the buildings. The maintenance facility is relocated to the southeast corner of campus where the science building was originally located.



Masterplan

Masterplan.....page 36

Main Campus ..... page 37

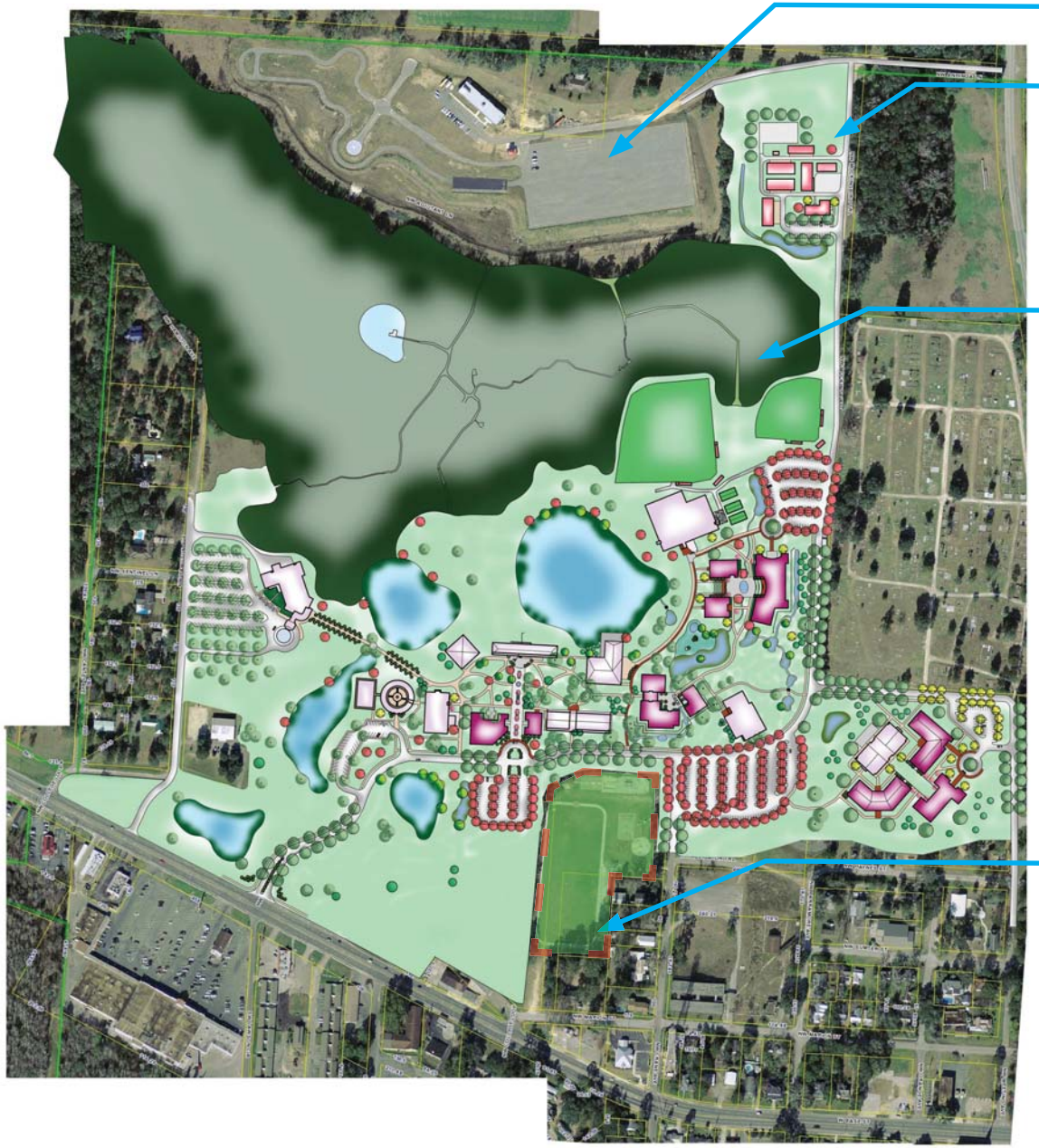
Planview Enlargements.....pages 38-40

Sections.....page 41

Stormwater Wetland.....pages 42-43

Perspectives.....pages 44-51

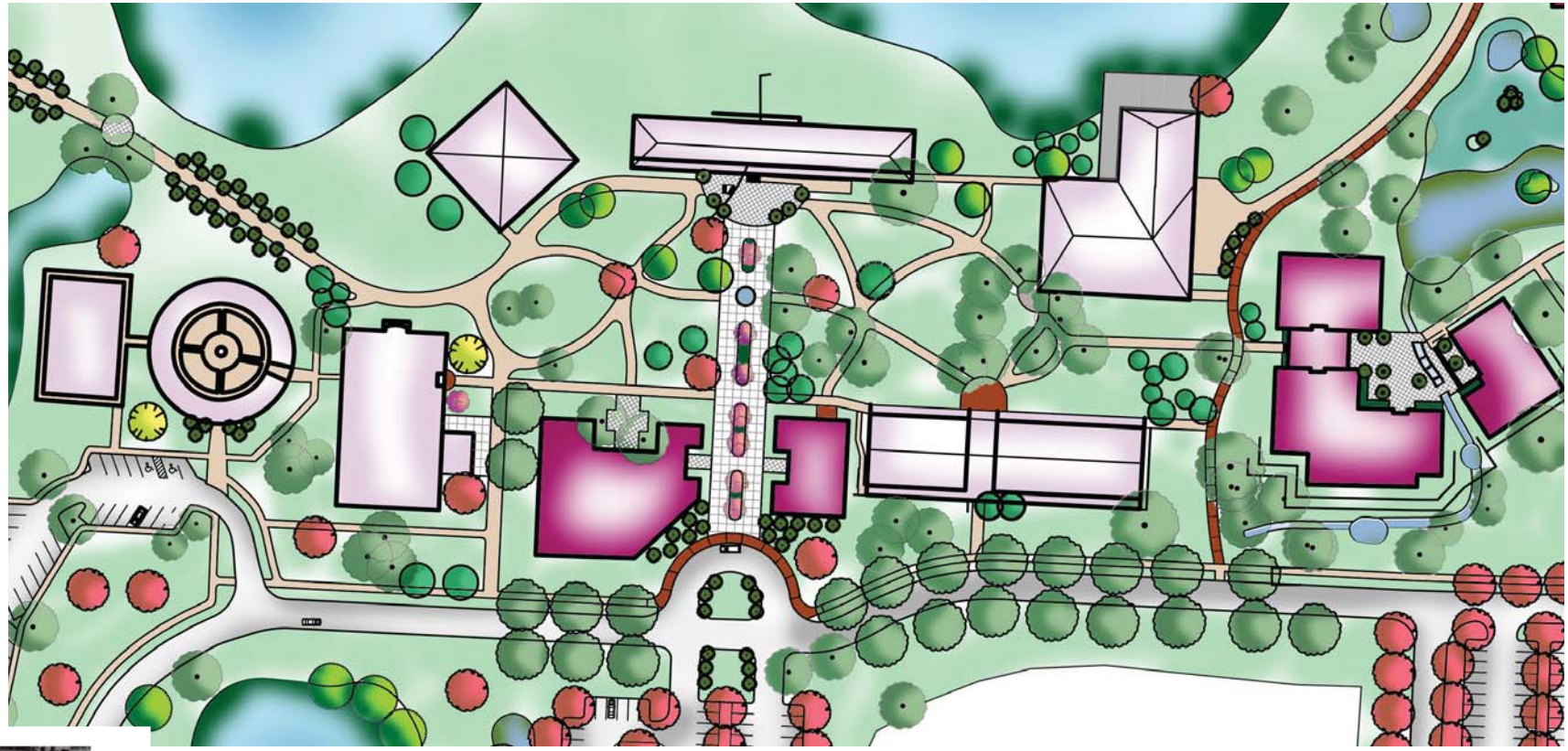
Masterplan


Public Safety Academy
Maintenance Facility
Existing Buildings
Proposed Buildings
Outdoor Environmental Center
Community Park
0
600’
1200’
1800’
Feet
Scale: 1” =600’

Main Campus

Existing Buildings
Proposed Buildings
A Auditorium
B Administration
C Library
D ST. Leo University
E Academic Support
F Student Center
G Arts and Humanities
H Gym
I Technical Career and Workforce Development Center
J History/Social Sciences
K Sciences
L Stormwater Wetland
0
400'
800'
1200'
Feet
Scale: 1" =400'

Plan View Enlargements



Inner Campus

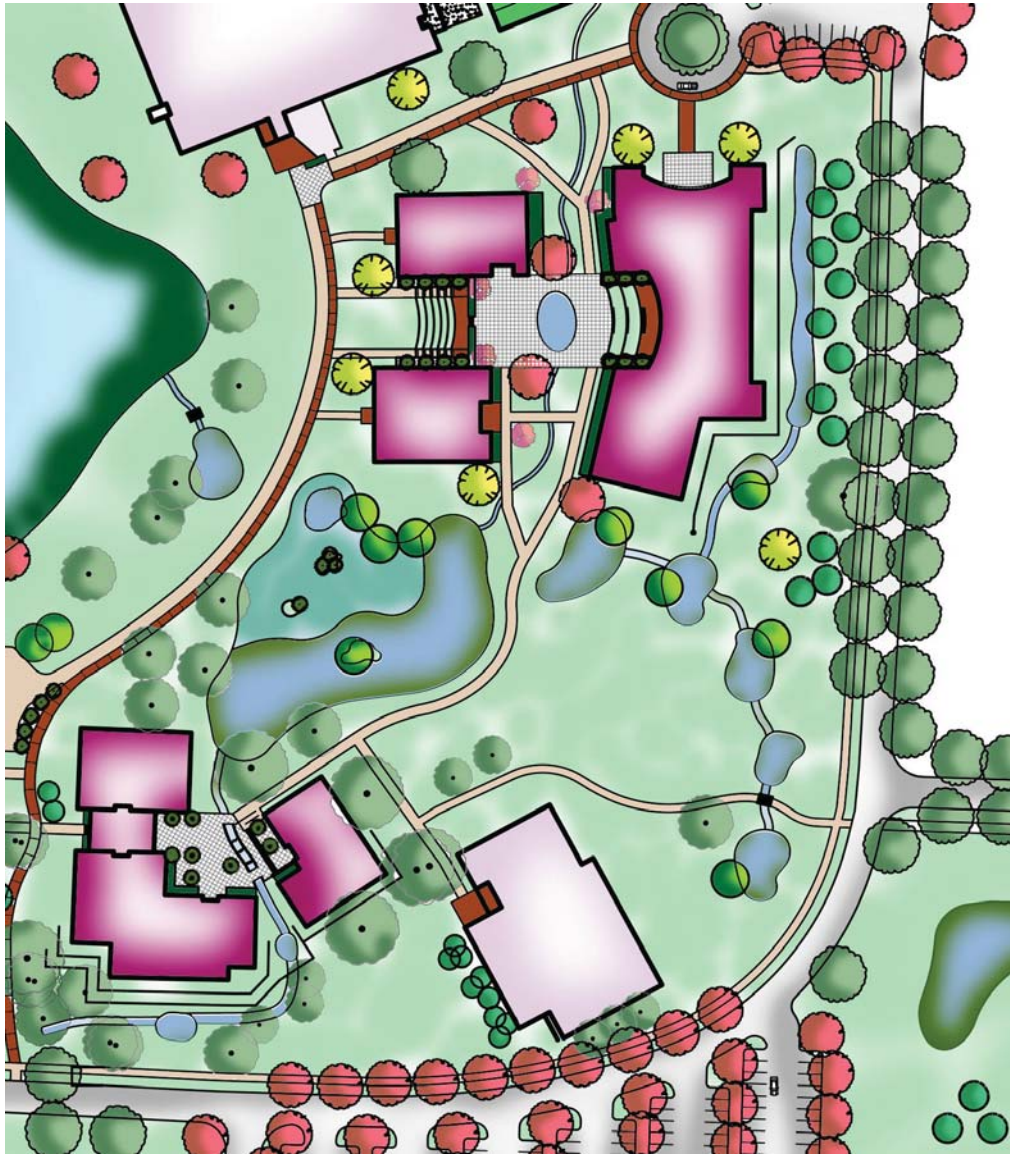
The magenta colored buildings in the center create the main entrance to the inner campus. A vehicle dropoff circle is placed in front of the buildings lined with sabal palm trees. A strong axis lined with flowering trees extends across the inner campus and ends as it reaches a building. The sidewalks create an organic figure 8 system that works its way throughout the campus connecting everything while giving the most direct route as possible. The magenta buildings to the east frame the space of the inner campus while pedestrians walk through the building and into a courtyard that connects to another section of campus.

Plan View Enlargements

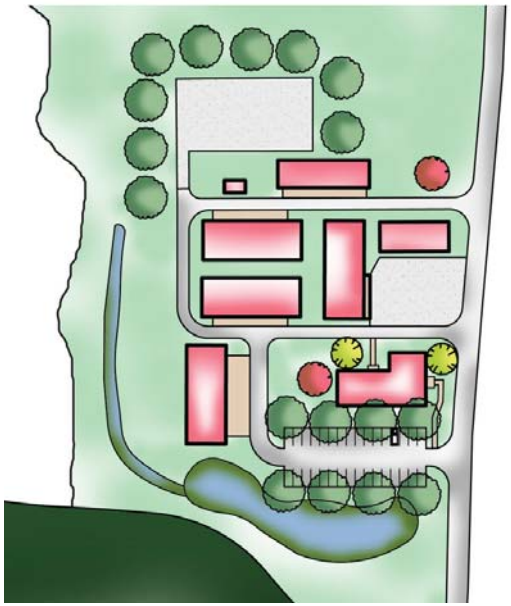
Eastern Side of Campus

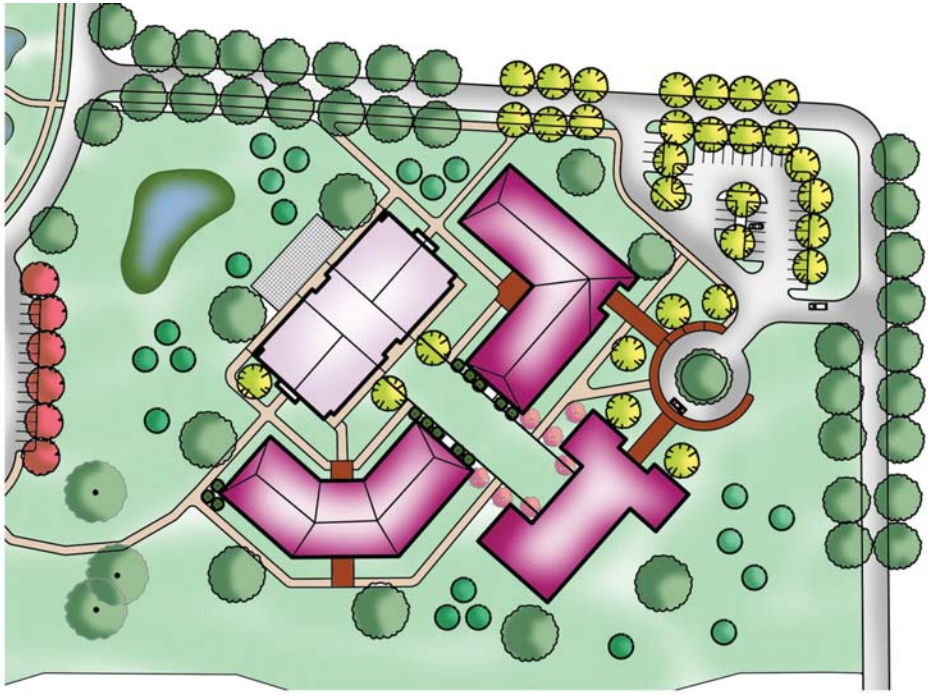
This part of the plan illustrates the Social Sciences and Art building complexes and there connection to the greenspace and stormwater management system as well as the stormwater wetland. Within the northernmost complex (Social Sciences) is a swale that carries water into a wet/dry pond in the courtyard and then further into the wetland. An amphitheater between the two buildings offers an outdoor learning environment and a view of the lake.

The southwestern complex (Art/Humanities) has a courtyard in the center with a wet/dry stream running through it. Water from the parking lot located to the south drains into the swale and flows through the courtyard and into the wetland before it is cleaned by vegetation before reaching the lake.



Plan View Enlargements





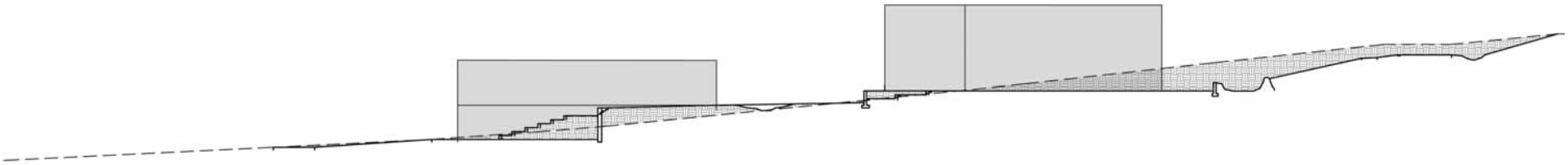
1) Maintenance Facility

The maintenance facility was relocated to the north of the property and a whole new complex was designed with larger storage facilities and a larger office and break room. Green space was also provided for the workers to relax in during breaks.

2) Technical Career and Workforce Development Center

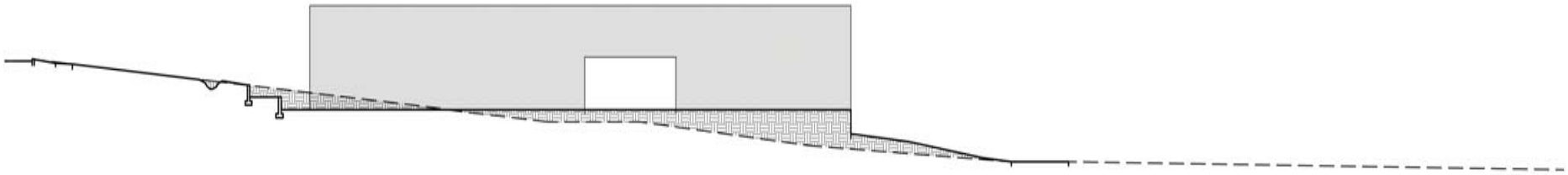
The light purple building is the existing science building. The parking lot that surrounded it was removed to build a complex of buildings here. This location is designated the Technical Career and Workforce Development Center because it is fragmented from the main campus by the road. It will likely have several evening classes taking place due to the difference in studies that will take place here.

Sections



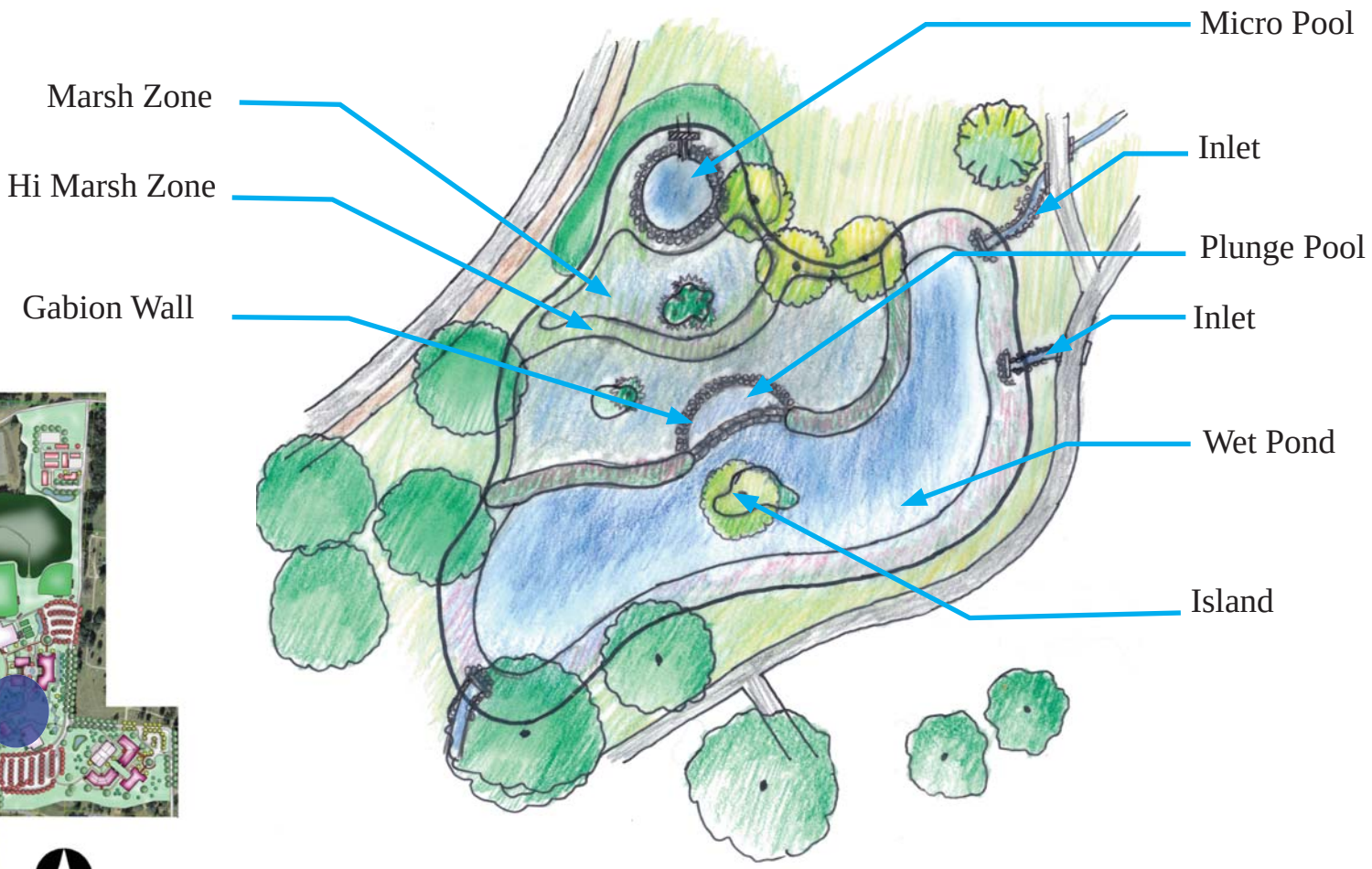
A Cut-Fill Section of Social Sciences Buildings

B Bio-Swale in Parking Lot



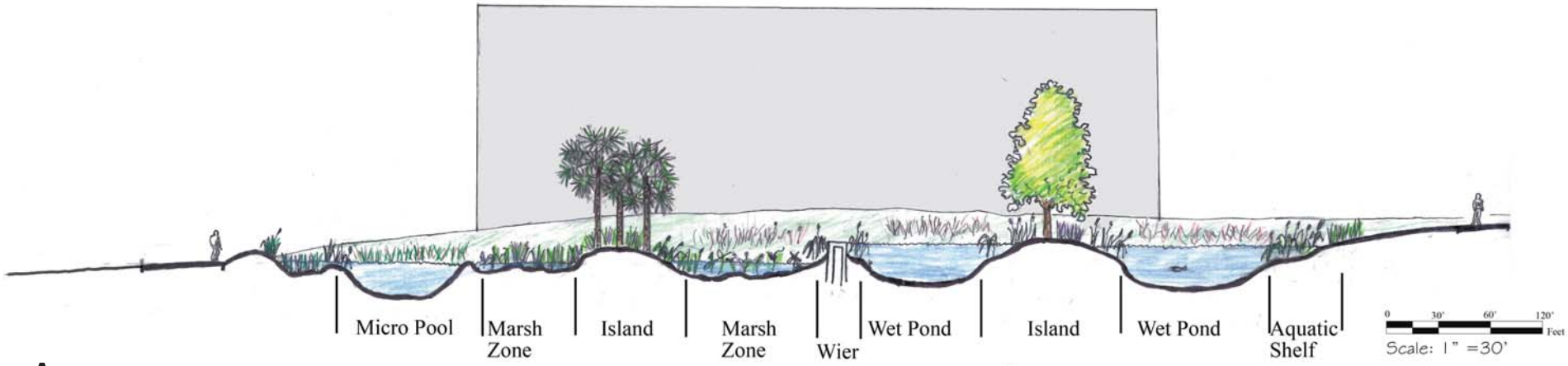
C Cut-Fill Section of Art and Humanities Buildings

Planview of Stormwater Wetland

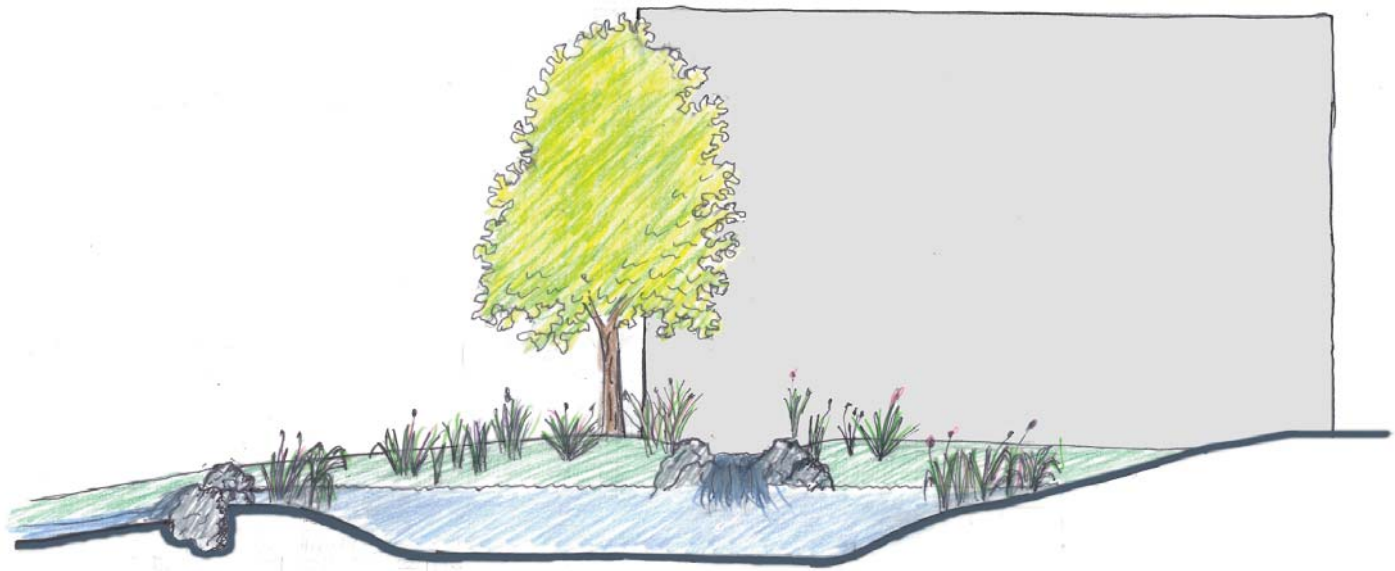


Stormwater Wetland

Sections

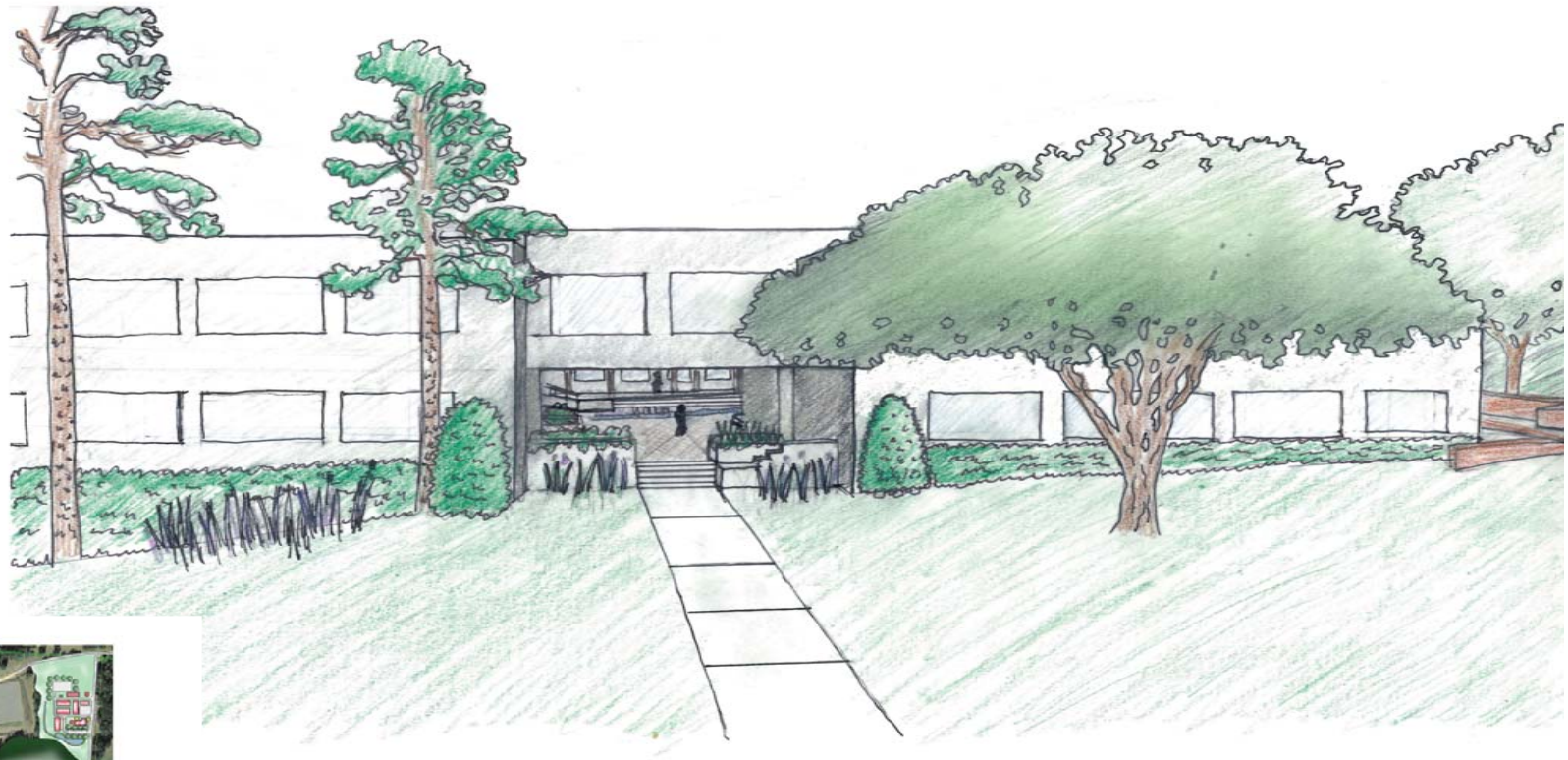


A Section cut through deep wet pond and wetland



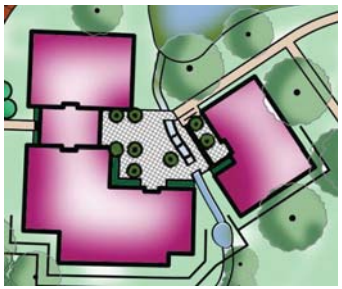
B Small Pond With Bio-Swale Draining Into It.

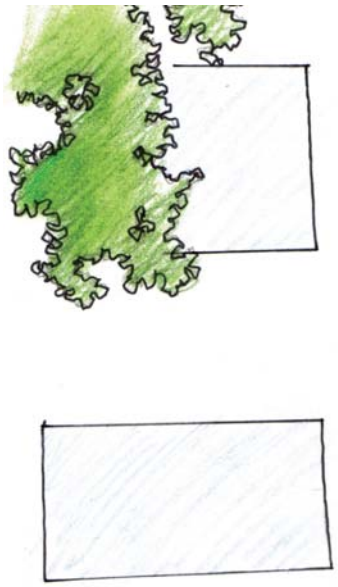
Art and Humanities Buildings

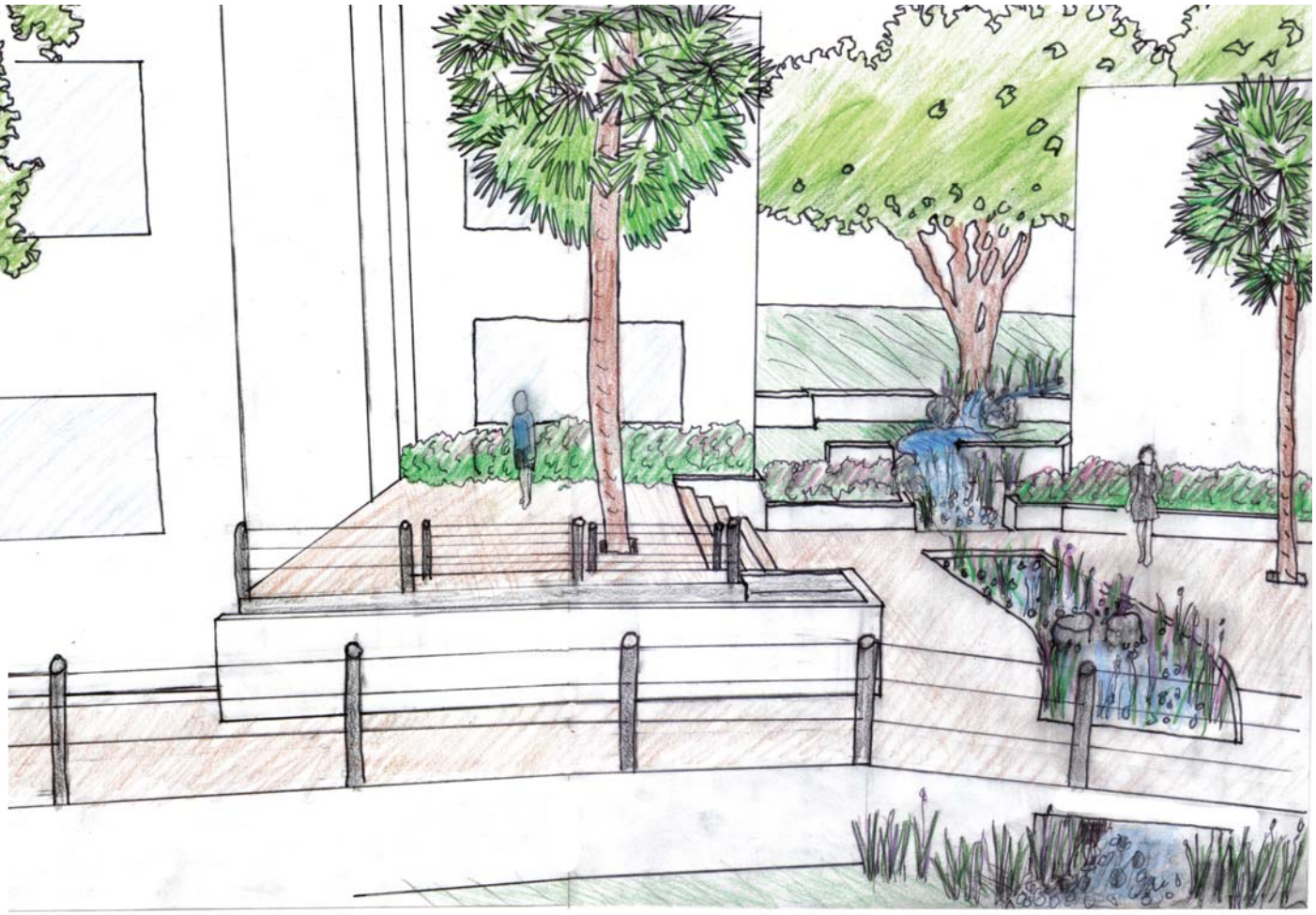


Entrance to Courtyard and Stormwater Wetland is Through the Building

Art and Humanities Buildings







Courtyard has a Stream Running Through It When Large Volume of Stormwater Runoff Exists

Perspectives

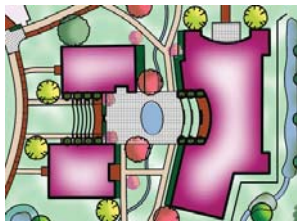
Main Entrance and Axis of the Inner Campus

Axis Between Proposed Buildings Connecting Vehicle Dropoff to Inner Campus. Flowering Trees Line the Axis.

Main Entrance and Axis of the Inner Campus

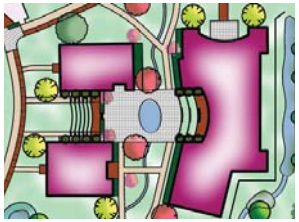
View From Within the Inner Campus. A Small Fountain with a Boulder in the Center is Located Where The Axial Pathway Crosses the Sidewalk that Meanders Through the Inner Campus Under the Canopy Trees.

Social Sciences Buildings



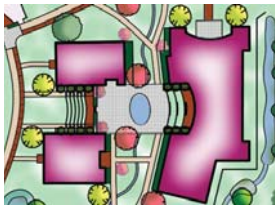
View of Amphitheater and Courtyard with Stormwater Detention Pond
Filled with Gravel and Muhly Grass

Social Sciences Buildings



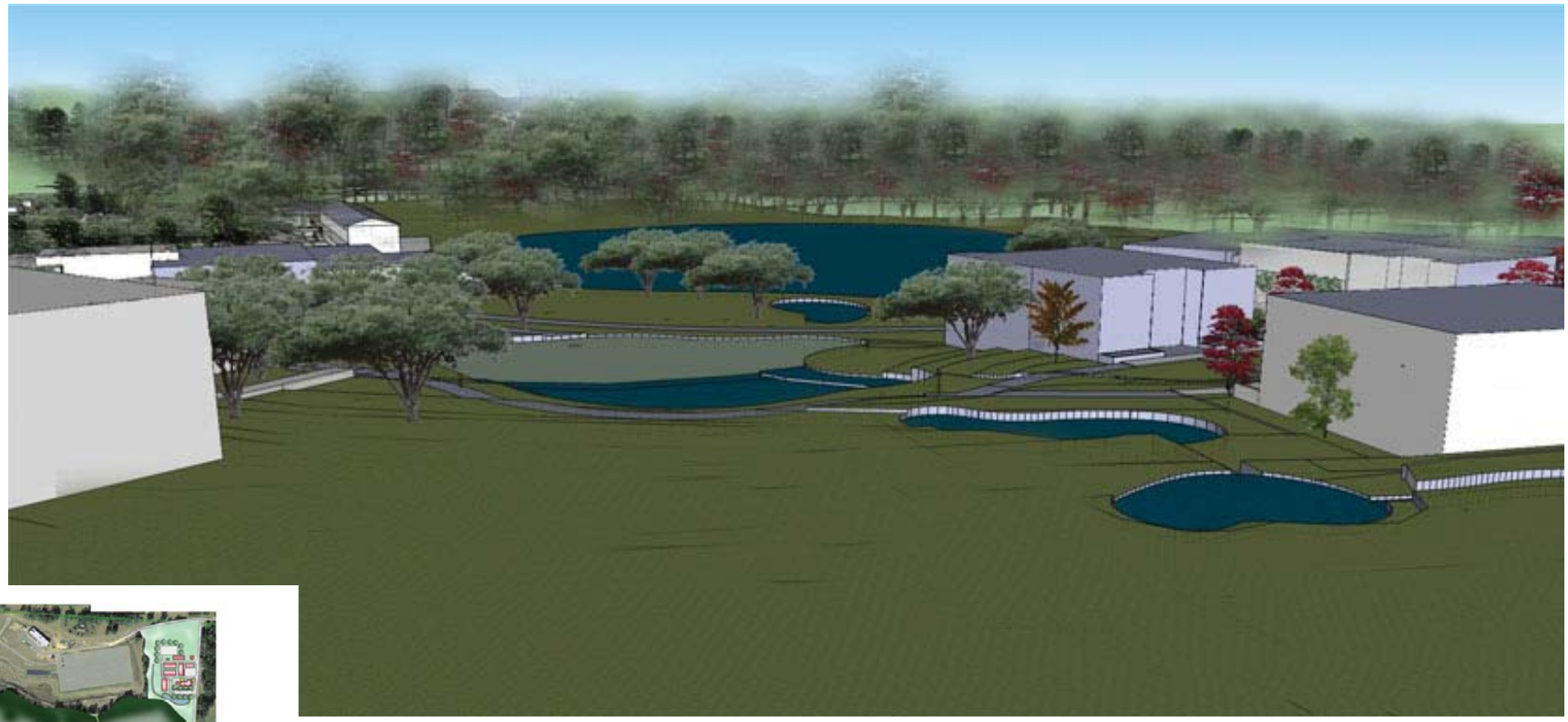
View From Within the Courtyard Looking at the Detention Pond in the Plaza with Stormwater Stream Running Through It

Social Sciences Buildings



View From the Plaza looking Out Over the Amphitheater and Lake Into the Hardwood Hammock

Greenspace and Stormwater Wetland



View of Greenspace Looking Over Stormwater Wetland and Treatment Ponds
With the Lake and Hardwood Hammock in the Viewshed

Case Studies

Evergreen State College Masterplan.....page 53

Sidwell Friends School .....page 54

Florida Aquarium Parking Lot And Queuing Garden..... page 55

Evergreen State College Masterplan

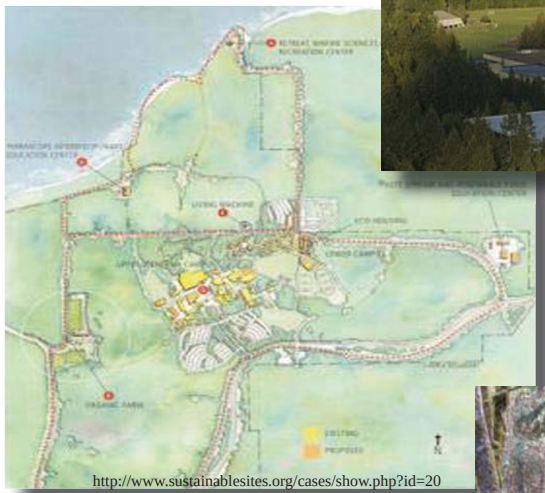
Location: Olympia, Washington

The campus is situated at the edge of the Puget Sound on 1033 acres with as much as 80% remaining as forest land. In 2008 a masterplan was created for Evergreen State College as part of a commitment and guide to developing a highly sustainable campus over a 15 year period. It aims to balance and reduce carbon use and waste production. The plan addresses such topics as transportation modes and patterns, energy production and use, ecosystem protection, construction practices, food production, student life and housing, and wastestream management. The campus is to be used as a laboratory for all aspects of sustainability ranging from stormwater management to maintaining school spirit.

The plan aims to get students and faculty involved through hands on learning by creating seven educational centers throughout campus that act as outdoor laboratories and classrooms. These include a Stormwater Monitoring Center where management systems will be exposed to allow interactive monitoring and measuring of water flows and quality. A sustainable Design Resource Center, an Organic Farm Education Center, an Alternative Energy Education Center and a Solid Waste and Renewable Fuels Education Center are also planned.

Preserving the native ecosystems is one of the target goals of the masterplan as well as focusing on connectivity within the campus and to the community of Olympia. Revising the intra-campus road network as well as paths and trails is a top priority. Trail heads are located near transit stops to increase accessibility to outdoor classrooms.

The masterplan also addresses the use of native plants and rainwater catchment devices for irrigation, storm and wastewater management as well as food and waste composting. It also specifies using natural fertilizers and cleaning products.



Sidwell Friends School (Middle School renovation and addition)

Location: Washington, DC

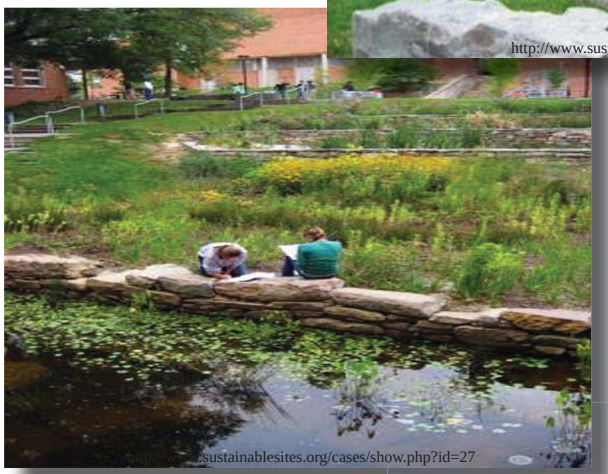
The school's fifty year old facility was renovated in 2007 to become both an indoor and outdoor teaching laboratory to teach environmental awareness to the students. The focus of the project is smart water management. The design incorporates a central courtyard with a rain garden, pond and constructed wetland that receives both storm-water and wastewater.

The centerpiece of the design is a natural wastewater system with a constructed wetland in the center. It produces high quality non-potable water by utilizing the natural cleaning processes of the plants. Native plant species of the Chesapeake Bay region were used in the design. Much of this water is recycled back into the building for re-use or used for irrigation. The wetland acts as a living laboratory for the students of biology, ecology, and chemistry. The students measure and compare nitrogen and phosphorous levels and also record wildlife sightings such as birds, owls, and butterflies.

Stormwater management is achieved through a series of rain gardens, swales, bio-filtration and habitat pools. There is also a green roof where the students grow vegetables and monitor and compare runoff with the conventional roof. Cisterns are placed underground to store water for irrigation. All of the site runoff is directed toward the rain gardens which are planted with native meadow species.

The majority of the materials in the hardscape are recycled or reclaimed. The lumber for the decks and boardwalk came from pilings from the Baltimore Harbor. Sidewalks were made from reclaimed flagstone and a dismantled railroad bridge provided stone for the steps and walls. Concrete with recycled slag was used for walkways.

http://www.sustainablesites.org/cases/show.php?id=27



sustainablesites.org/cases/show.php?id=27

http://www.sustainablesites.org/cases/show.php?id=27

Florida Aquarium Parking Lot and Queuing Garden

Location: Tampa, Florida

The Florida Aquarium partnered with the Southwest Florida Water Management District in 1993 to build an 11.25 acre research and demonstration area to monitor stormwater runoff in parking lots. The study compared low impact, alternative, sustainable design practices to conventional methods.

Stormwater runoff from the Aquarium roof and parking lot was directed into a "treatment train" for cleaning and filtering water. This is chain is a series of bio-swales combined with smaller basins that converge into larger ones, and then through a linear progression of vegetated filtering zones. Permeable paving was also a component of the demonstration area.

The new parking lot had to be one-third smaller in size than the original to give way to a cruise ship terminal. This made the need to maximize the number of spaces critical to the design. Green space within the design was increased by reducing the size of each parking space by two feet. This extra space was used for bio-swales planted with grasses. The front end of the cars were then allowed hang over the grasses rather than pavement.

After monitoring 59 rain events over two years the research showed that the sustainable practices substantially reduced runoff volume and protected water quality. The basins that contained pervious paving had the highest percent of removal of pollution loads and many removal rates for metals was greater than 75 percent.

http://www.sustainablesites.org/cases/enlarge.php?id=16&image=2

http://www.sustainablesites.org/cases/show.php?id=16

References

Contacts:

Garner, Patricia

- Director of Green Industries Institute (Satellite campus of North Florida Community College). Monticello, Fl. (850) 973-1702. garnerp@nfcc.edu
  Graduate of Landscape Architecture, University of Florida

Mulkey, Amelia

- Dean of Administrative Services (North Florida Community College). Madison, Fl. (850) 973-1604. mulkeya@nfcc.edu

Research References:

Case Studies:

- Evergreen State College Masterplan, Olympia Washington
  Sustainable Sites Initiative. http://www.sustainablesites.org/cases/show.php?id=20 11/3/2010
- Florida Aquarium Parking Lot and Queuing Garden. Tampa, Florida.
  Sustainable Sites Initiative. http://www.sustainablesites.org/cases/show.php?id=16 1/2/2011
- Sidwell Friends School (Middle School renovation and addition), Washington, DC
  Sustainable Sites Initiative. http://www.sustainablesites.org/cases/show.php?id=27 11/3/2010

Books:

- Dober, P. Richard. *"Campus Design"*. John Wiley and Sons Inc. Canada. 1992
- Dober, P. Richard. *"Campus Landscape Function, Forms, Features"* John Wiley and Sons Inc. Canada. 2000

References

Websites and Documents Found on Web:

•Bio-Retention and Wet Pond Design. Mark Meyer, PE.
http://www.shawnature.org/documents/pdf/MSD%20Mark%20Meyers%20Bio%20Retention%20Design%202.pdf

• Florida Geographic Data Library (FGDL). *www.fgdl.org/*

• Hansen, Gale (Environmental Horticulture, University of Florida) *http://edis.ifas.ufl.edu/topic_a11788330*

• Madison County Planning Office. *http://www.madisoncountyfl.com/cd-planning.aspx*

•Madison County Property Appraiser. *http://www.madisonpa.com/*

• Minnesota Urban Small Sites BMP Manual. Constructed Wetlands: Stormwater Wetlands.
http://www.metrocouncil.org/environment/Water/BMP/CH3_STConstWLSwWetland.pdf

• North Florida Community College website. *www.nfcc.edu*

• Sustainable Campus.org. *http://www.sustainablecampus.org/*

• Sustainable Sites.org *http://sustainablesites.org/*

•The Neighborhood Model: Building Block for the Development Areas. Section 6: 11, Site Planning That Respects Terrain, Building on Slopes
http://www.albemarle.org/albemarle/upload/images/forms_center/departments/community_development/forms/Neighborhood_Model/Neighborhood_Model_Design_Approch_for_ Principle11.pdf

Project Data:

• GIS data: Topography, Soils, property boundaries, ecosystems, watershed.
• Madison County Comprehensive Plan: 1991 (Outdated but has updated amendments going to 2009).
• Site Photos (Personal collection)
• Soil Survey; Madison County
• Survey; AutoCad base: Shows 1 ft contours, existing water bodies, and building footprints.