

Sustainable Landscape Design for the Illinois
Institute of Technology Rice Campus

IPRO 319 – Fall 2005

Project Plan Report

Objective

This semester, the team will continue on the work completed in the spring 2005 term as IPRO 371. The main goals for fall 2005 are to further research elements commonly found in sustainable landscape designs and to create a comprehensive landscape design, composed of the three key areas of appropriate vegetation, stormwater management, and stream restoration at the IIT Rice Campus. In addition, we will research the economic implications of our design and attempt to locate potential sources of funding.

Background

In 1991, the Rice Campus opened following the generous gift of nineteen acres of land in Wheaton, Illinois from the Rice Foundation. The Rice Campus offers a plethora of educational options through the Center for Professional Development. It serves as a facility for many corporate functions by day and offers courses to students by night. In this way, the Rice Campus serves both the business and individuals of Wheaton and the surrounding areas.

The development and improvement of the landscape at the Rice Campus is beneficial to IIT and the community of Wheaton. The community and IIT stand to gain if the land surrounding the Rice Campus is improved. A more impressive landscape will make the building a more attractive venue for holding corporate events. As such, it will be a bigger asset to IIT.

The proposed methodology of design for the landscape at Rice Campus is what is known as a sustainable landscape. A sustainable landscape is a landscape that will improve the environment and reduce labor costs. Sustainable landscapes improve the environment by properly managing environmental resources (such as rain water) and providing enhanced wildlife habitats. These landscapes also lower costs by introducing plants that are appropriate to the region. A sustainable landscape plan will not only improve the look of the Rice Campus, but, in the long run, will reduce the cost of maintenance.

The reason that our team proposes to introduce sustainability to the Rice Campus is that the landscape is currently significantly underdeveloped. The vast majority of the campus terrain consists of short turf grass that provides little, if any, environmental benefit while requiring sizable maintenance costs. In addition, impervious surfaces on the campus contribute significant amounts of pollutants into Willoway Brook and all subsequent downstream locations.

The situation also presents the opportunity for IIT to take a leadership role in the community. By introducing elements of sustainable landscape, rainwater management, and other environmentally friendly initiatives into their landscape, the Rice Campus will provide a role model for landscapes throughout the community.

Research Methodology

The IPRO Team will undertake research by defining three central areas of sustainable landscape design: Stormwater management, stream restoration, and appropriate vegetation. The team is to be divided into three sub-teams each of which are assigned one of the aforementioned topics to research in depth. The teams will meet on a regular basis throughout the semester to exchange information and reevaluate objectives, tasks and their progress towards the final goal. Finally, the IPRO Team, as a whole, will create a comprehensive design for a sustainable landscape at the IIT Rice Campus.

In addition, guest speakers in different areas of sustainable landscape design are scheduled to offer their expertise to our IPRO team at different points throughout the semester.

Individual Assignments

The IPRO is guided by a single vision statement. In addition to this, each sub-team has prepared a unique set of objectives to focus their research. Along with these objectives will be mission statements to identify the purpose of their work.

A Vision for IPRO 319

“By 2010, the grounds at IIT’s Rice Campus in Wheaton, Illinois will be transformed into a vibrant setting to demonstrate the accord between the natural landscape and its inhabitants.”

Mission Statement for sub-group: Appropriate Vegetation

The Appropriate Vegetation group will design and implement a full landscape transformation plan for the vegetation at the IIT Rice Campus, benefiting the surrounding community.

Objective 1: To Research appropriate Vegetation

Task 1: Assess the current state of the landscape (inventory)

Timeframe: End of week 4

Task 2: Acquire a general topography map

Timeframe: End of week 8

Task 3: Research native and appropriate plants for the area

Timeframe: End of week 8

Task 4: Basic soil survey

Timeframe: End of week 8

Task 5: Research economic implications of changing the vegetation

Timeframe: End of week 12

Task 6: Open dialogue with the Oak Savanna group and Morton Arboretum

Timeframe: End of week 12

Objective 2: To develop a landscape schematic

Task 1: Determine what key items we want in the landscape

Timeframe: End of week 12

Task 2: Develop a scaled drawing of the landscape

Timeframe: End of week 12

Objective 3: To assimilate our objectives and tasks with the other sub-groups

Task 1: Email the other groups about our objectives and tasks

Timeframe: Continuous basis

Task 2: Scheduling meetings with the other groups periodically throughout the semester

Timeframe: Continuous basis

Task 3: Re-assess our objectives and tasks according to the meetings

Timeframe: End of 4th, 8th, and 12th weeks

Objective 4: To come up with a plan to communicate with the community

Task 1: Gather an inventory of stakeholders in our project

Timeframe: End of week 4

Task 2: Develop a survey for the community to fill out for feedback

Timeframe: End of 4th and 8th weeks

Task 3: Develop different surveys for the students and faculty at Rice Campus

Timeframe: End of 4th and 8th weeks

Task 4: Get in contact with community officials

Timeframe: End of week 12

Objective 5: To implement our landscape design

Task 1: Investigate different avenues for our implementation

- Another IPRO
- Volunteer work
- Contractors
- Non-profit group

Timeframe: End of 14th week

Mission Statement for sub-group: Stormwater Management

Utilize stormwater on the Rice Campus to promote vegetation and to reduce the detrimental effects to the surrounding environment and community.

Objective 1: To reduce the area of harmful impervious surface and to investigate the current runoff situation of the impervious surfaces

Parking surface

- Task 1: Review past IPRO's investigation on runoff amount/impact
Timeframe: End of week 4
- Task 2: Investigate traffic and parking patterns in the parking lot
Timeframe: End of week 4
- Task 3: Determine ideal number of spots for a permanent parking location
Timeframe: End of week 4
- Task 4: Identify alternatives to on-site parking (strip mall nearby) for excess parking at high traffic times
Timeframe: End of week 8
- Task 5: Investigate alternative paving materials/methods (pavers, reconstructing or regarding parking lot, adding filter strips, and developing islands in parking lot) with regards to all practicality issues (snow maintenance, life expectancy, climate suitability, cost analysis)
Timeframe: End of week 4
- Task 6: Investigate current water flow generated by parking lot, its management, and its cleanliness/health versus natural rainfall
Timeframe: End of week 4
- Task 7: Analyze grading and water flow over the impervious surfaces
Timeframe: End of week 8
- Task 8: Determine which sections of the site contact the runoff first from the impervious areas
Timeframe: End of week 8
- Task 9: Determine amount of runoff flowing into drainage system
Timeframe: End of week 8
- Task 10: Review ordinances and requirements for parking lots of educational sites
Timeframe: End of week 4
- Task 11: Obtain accurate measurements for the dimensions of the impervious surfaces in parking lot and drive ways.
Timeframe: End of week 4
- Task 12: Make recommendations to resolve parking as a major source of harmful stormwater runoff on the Rice Campus
Timeframe: End of week 8

Rooftop surface

- Task 1: Review the current rooftop water management strategies
Timeframe: End of week 4
- Task 2: Identify locations for positive interventions both on the rooftop and at the base of drainage downspouts.
Timeframe: End of week 4

- Task 3: Collaborate with vegetation group to identify appropriate plants for downspout rain garden locations
Timeframe: End of week 8
- Task 4: Research water quality after going through roof water management system versus direct-to-earth rainfall
Timeframe: End of week 8
- Task 5: Obtain accurate measurements for the dimensions of the impervious surfaces on building rooftop
Timeframe: End of week 4
- Task 6: Analyze runoff water content to determine what needs to be filtered or prevented from entering Willoway Brook
Timeframe: End of week 8

Objective 2: To assess current amount and impact of runoff from Rice Campus and the change to the stream if runoff is limited from the site

Our site's runoff data

- Task 1: Acquire topography data for the campus and surrounding area
Timeframe: End of week 4
- Task 2: Investigate other resources for information on water flow already existing (EPA, local ordinances)
Timeframe: End of week 4
- Task 3: If data are unavailable, view general-information sources to determine how to calculate runoff water per given area
Timeframe: End of week 4
- Task 4: Investigate cleanliness of water as it leaves the campus's impervious surfaces and as it enters the stream (how well is the vegetation doing at the current time?)
Timeframe: End of week 8
- Task 5: Identify locations other than non-pervious surfaces that contribute negatively to stormwater purity, such as erosion locations and unhealthy guttering systems...
Timeframe: End of week 4
- Task 6: Gather enough data to confidently recommend an appropriate level of runoff absorption to maintain the health of the stream for our site and downstream.
Timeframe: End of week 8

How our site affects the river

- Task 1: Acquire stream data for points at the water's entrance to the site and exit for a variety of times throughout the year
Timeframe: End of week 8
- Task 2: Investigate water quality before and after leaving the site
Timeframe: End of week 8
- Task 3: In general, get information from the stream restoration about current and ideal levels and health of site runoff

Timeframe: End of week 4

Objective 3: To determine the feasibility of an over-flow mechanism and the vulnerability/susceptibility of the plant life in the over-flow area to drastic changes in water amount

Task 1: Determine which plants would be best suited for the conditions from Vegetation group

Timeframe: End of week 8

Task 2: Examine current landscape for ideal location

Timeframe: End of week 4

Task 3: Work with stream restoration for combining landscape change

Timeframe: End of week 8

Task 4: Examine possible control systems for controlling water; automated or manual?

Timeframe: End of week 4

Task 5: Determine maximum water capacity needed or expected

Timeframe: End of week 8

Task 6: Try to find a previous implementation similar to our plan

Timeframe: End of week 4

Objective 4: To analyze current conditions of water

Flowing into the stream from the residential area

Task 1: How much water is actually flowing

Timeframe: End of week 4

Task 2: What is the water quality

Timeframe: End of week 4

Task 3: How much water is present in certain conditions such as rain, is there too much or too little

Timeframe: End of week 4

Task 4: Where does the water originate when around the residential areas

Timeframe: End of week 4

Flowing into the stream from Rice Campus

Task 1: Analyze flow of runoff into drainage system (i.e. from parking lot and roadways)

Timeframe: End of week 8

Task 2: Analyze runoff coming from grass over the banks of the stream (flow rate and volume)

Timeframe: End of week 8

Task 3: Analyze water contents as it enters stream from inlet pipes of drainage system and as it flows over the banks

Timeframe: End of week 8

Staying on Rice Campus

Task 1: View detailed elevation map to estimate the drainage areas

- Timeframe: End of week 8
- Task 2: Investigate soil absorption rates
Timeframe: End of week 8
- Task 3: Make notice of areas where water is accumulating
Timeframe: End of week 8
- Task 4: View ordinances to ensure that all stormwater management is in compliance with local regulations
Timeframe: End of week 8

Objective 5: To determine steps needed to take to change the site conditions to utilize on-site water and limit polluted runoff

- Task 1: Examine shortcoming of current system
Timeframe: End of week 4
- Task 2: Determine changes needed in land grading for controlled runoff
Timeframe: End of week 8
- Task 3: Determine best method for filtering water; pervious pavers or vegetative cleaning using flood area
Timeframe: End of week 8

Mission Statement for sub-group: Stream Restoration

Our responsibility is to analyze and solve the environmental problems with a section of Willoway Brook, while simultaneously providing a basis for educating the surrounding community about the benefits of sustainable landscapes.

Objective 1: To analyze existing problems with Willoway Brook

- Task 1: Analyze incoming and outgoing sources of water into Willoway Brook.
Timeframe: End of week 4
- Task 2: Analyze streambank characteristics (vegetation, shot rock, erosion)
Timeframe: End of week 4

Objective 2: To devise potential solutions to the existing problems

- Task 1: Brainstorm solutions.
Timeframe: End of week 8
- Task 2: Research into how prior projects have solved similar problems.
Timeframe: End of week 8
- Task 2: Coordinate with other subgroups concerning common issues or problems.
Timeframe: Continuous basis

Objective 3: To estimate potential costs for these solutions

- Task 1: Look to outside sources for consultation.
Timeframe: End of week 8
- Task 2: Analyze the costs of similar prior projects.
Timeframe: End of week 8

Task 3: Analyze construction and maintenance costs.

Timeframe: End of week 8

Task 4: Identify potential sources of funding.

Timeframe: End of week 8

Objective 4: To decide on, and create a design implementing, the solutions.

Task 1: Compile solutions into comprehensive design.

Timeframe: End of week 12

Task 2: Propose design to chief stakeholders.

Timeframe: End of week 14

Task 3: If approved, develop a design implementation schedule.

Timeframe: End of week 14

Expected Results

The IPRO Team expects that by the end of the semester a comprehensive design for a sustainable landscape at the IIT Rice Campus will be completed. A line item cost estimate for the design will be prepared as well. Time permitting, the design will be submitted to the necessary stakeholders at IIT and DuPage County for approval. In addition, all IPRO deliverables will be completed and delivered on time per the guidelines set by the IPRO Office.

Project Budget

The costs here were estimated based on last semester's budget analysis.

Visiting rice campus (travel expenses)	\$125
Complete documents and reports	\$100
Presentation costs	\$300
Advertising	\$50
Surveys	\$50
Maps and topographical surveys	\$300
Contract fees	\$400
Phone calls	\$15
Total	\$1340

Task Schedule

Project Plan	September 16
Mid-Term Progress Report	October 21
Exhibit	November 28
Project Abstract	November 28

Web Site	November 29
Final Oral Presentation	November 30
Final Report	December 9
Team Information	December 9
Comprehensive Deliverables CD	December 9