

CASE STUDY OF A RENOVATION OF A  
SATELLITE COLLEGE FOODSERVICE CONCEPT  
ACCORDING TO THE UNITED STATES GREEN  
BUILDING COUNCIL'S LEED RATING SYSTEM

By

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## CHAPTER I

### INTRODUCTION

The college environment not only fosters the opportunity for an individual to gain a college degree, but also an environment that fosters research and opportunity. One of the components that make up a campus environment is that of the residence hall cafeteria. For the purpose of this study the cafeteria will be defined as a foodservice concept within a campus housing environment. The renovation of the campus foodservice concept is a growing area of concern not only because much of the infrastructure of these areas is increasingly aging, but also for the growing interest of sustainability, and more specifically that of the LEED program.

Leadership in Energy and Environmental Design (LEED) is a rating system from the United States Green Building Council (USGBC) (USGBC, 2010). The LEED rating system provides a set of standards for environmentally sustainable construction both for the external environment and internal environment. LEED certified buildings are supposed to use resources more efficiently when compared to conventional buildings. LEED certified buildings often provide healthier work and living environments, which contributes to higher productivity and improved employee health and comfort (USGBC, 2010).

Businesses today are looking for ways to maintain or increase their revenue, and the incorporation of LEED into their business helps to accomplish a portion of their revenue goals through providing a new point of interest through the design component. Foodservice has been



researched and proven to be an important component within a business; not only to grow revenue, but also to attract a wider customer base. Therefore the renovation of the foodservice concept is worthy of the time and finances to meet the needs of the business and to offer the utmost in customer service.

The purpose of this study is to evaluate plans for a design of a renovation of a satellite cafeteria according to the LEED rating system. The research will look at the renovation of a dining center as a whole and as well as according to the LEED standards, and the design component will re-design a concept within the facility. Due to the time and available resources; the entire facility will be evaluated according to the LEED program, but the renovation component will be specifically for one concept area within the center. To broaden the field of research based resources for this particular topic another purpose for this study is to increase awareness of resources for the field of higher education foodservice facilities. The intended study will focus on the LEED program and its components as well as those that are relevant to the foodservice and commercial kitchen environments.

### **Definitions related to Interior Design and Foodservice**

**Back of House (BOH):** The private zone where employees and staff are allowed (Nussbaumer, 2009).

**Concept:** The idea for a restaurant, which encompasses menu, theme, décor and other factors that create an image in the mind of customers. (Katsigris, Thomas, 2006).

**Front of House (FOH):** The public zone where customers or clients are allowed (Nussbaumer, 2009).

**Gray water (Non-potable water):** Water from sinks, showers, and the laundry that is collected and lightly treated for reuse for watering lawns and other places where potable water is not required (Piotrowski, Rogers, 2007).

**Green Design:** Designs that use products and services that reduce use of non-renewable resources and minimize the ecological or environmental impact (Nussbaumer, 2009).

**Indoor Air Quality (IAQ):** The content or quality of indoor air that could affect the health of building occupants (Nussbaumer, 2009).

**Sustainability:** Building structures of planning businesses with conservation of natural resources in mind. Also known as green building (Katsigris, Thomas, 2006).

**Sustainable Design:** Design that is done to meet the present needs of the project while considering the needs of future generations. Sometimes referred to as green design (Piotrowski, Rogers, 2007).

**Programming phase:** The information-gathering portion of an interior design project (Piotrowski, 2008).

**Schematic design phase:** The phase of the design project in which preliminary design decisions and documents are prepared (Piotrowski, 2008).

**Design development phase:** Involves final design decisions for plans, specifications, and preparation of final presentation documents (Piotrowski, 2008).

## CHAPTER II

### REVIEW OF LITERATURE

#### **Foodservices for the campus setting**

Foodservice is an important component of overall planning that affects the overall quality of life on campus. According to Klassen, Trybus, and Kumar (2005) the U.S. Department of Education estimated that 15.3 million students were enrolled in undergraduate and graduate programs in Fall 2001. In the next ten years, colleges and universities are expected to see enrollments increase by about twenty percent (Klassen, Kumar, Trybus, 2005). Awareness of this trend and the challenges in ensuring adequate food service on campus to meet the growth in population can only improve the overall dining experience on campus.

The campus foodservice environment has been developing to meet the rising enrollments, student expectations, and evolving campus cultural needs. Many foodservice operations were initially established with a dining concept that fed a large amount of people in a short amount of time. This early dining concept consisted of a set menu with minimal alterations for the customer. Campus foodservices across campuses have had to alter their style of service to continue to attract the student, staff, faculty and public visitor to the college or university. To do this many of the early dining concepts have been altered for a more customized

concept that will enable the customer multiple choices and variable dining hours. Customization of the dining environment enables the foodservice concepts across campus to be appealing to the campus population.

Foodservice on campus is different from most other food service outlets. Typically restaurants outside of a campus setting have customers attend because of the restaurant's location appeal or its offerings; eating is the purpose for going there. Within a campus environment, students are there because of classes and eating is done mainly out of necessity. There is evidence that few go to campus just to eat. For instance, many campus foodservice operations do not have Friday evening or weekend hours (Klassen, Kumar, Trybus, 2005).

Providing appropriate food services in a campus setting is increasingly important due to more demanding customers and because students have less time to go off-campus when they need to eat. Klassen, Kumar, and Trybus (2005) discuss two criteria, location and speed in which they can easily attain their food and walk back to class as the main criteria students use to determine if they will purchase food. Klassen, Kumar, and Trybus (2005) surveyed students to help explain the importance of proximity of classes to food service. It is shown that foodservice operations with a similarity in terms of speed of service, suggest that the main difference exists in the students' walking time (Klassen, Kumar, Trybus, 2005). Therefore, a "short" walk to a dining outlet is more attractive than an outlet that takes "long" to get to. A "long" walk defined in the study is a seven minute walk (Klassen, Kumar, Trybus, 2005). Anything less would constitute a short walk and appear more attractive to the student.

Klassen, Kumar, and Trybus (2005) analyzed aspects that contributed to the planning of foodservices for the campus setting. They concluded that the campus they researched needed more food outlet options. Their results were based upon the students' responses to the surveys and their mapping of the students' movements across campus at certain intervals. Based upon

information about students traveling time on campus to a dining outlet they determined student's preferred not to walk too far to get a quick meal or snack (Klassen, Kumar, Trybus, 2005).

Understanding the necessity the student has for the campus dining environment is important for dining managers to meet those basic needs and affect the quality of life on campus.

### **Trends in college foodservices**

The college foodservice environment is currently experiencing many alterations in their normal everyday way of business and will see many changes in the future. Topics of particular interest for trends for the future within the overall higher education environment include the following topics:

- Sustainability (NACUFS, 2008)
- Rising costs (NACUFS, 2008)
- Demographic changes (NACUFS, 2008)
- Technology (NACUFS, 2008)
- Institutional brand differentiation (NACUFS, 2008)
- Security (NACUFS, 2008)
- Health and wellness (NACUFS, 2008)

Of those topics that are affecting higher education, the following will directly be of interest and influence for the college foodservice environment:

- Sustainability within higher education directly affects the college foodservice environment (NACUFS, 2008). The anticipated effects of climate change and other negative environmental impacts pose a distinct threat to colleges and universities, including steep prices in food and energy, continued access to clean food and water, new

health issues, and environmentally considerate materials for the built environment (Lawn, 2007).

- Convenience retailing and merchandising as a core competency to display food well and as a key component to the operation for increase within sales (Lawn, 2007).

Convenience retailing can increase the effect impulse-buying displays within “mini C-Store” operations in foodservice environments and the sale of convenience food items (Lawn, 2007).

- Component cooking that allows products to be created “just-in-time” for efficiency in the methods to bring together raw materials, ingredients and convenience items throughout the production process and safely with the use of the Hazard Analysis of Critical Control Points (HACCP) program (Lawn, 2007). When treated as components this allows more efficiency within the manufacturing process and can simplify component storage and usage ultimately increasing the quality and efficiency at the same time.
- Take-in Take-out is a trend that realizes the nature of today’s workplace and its influence upon the higher education environment (Lawn, 2007). Due to the pressure of the economic situation, there is a decrease in labor and an increase in demand. This demand finds customers buying food items that can be quickly prepared, served, and easily carried to their destination...or consumed en route. This signals a change in the traditional dining room environment and insists for a foodservice environment to be successful it must include items that can be “grab and go” and a built environment that is conducive to this customer profile (Lawn, 2007).
- Food transparency is an evolving concept that increases the customer’s knowledge about the origins, growing methods, transportation, storage, processing of their food, and its cumulative carbon footprint (NACUFS, 2008). The utilization of local farmers for

produce items, and on site food production sites allows for local and transparent supply within the foodservice environment.

- Health and wellness trends are a continuing interest within the college environment. These trends on campuses mirror those of the society in relation to obesity, interest in nonwestern, traditional, spiritual healing, and the healthy diet and lifestyle (NACUFS, 2008). Nutrition will be impacted by consumer increasing awareness of allergies and food intolerances (NACUFS, 2008).
- Technology will be at the forefront of trends affecting the college foodservice environment. Technology enables the customer access to the location via a wide format of applications. Customer traffic will be drawn to the college foodservice outlet via text, email, cell phone, and podcasts (NACUFS, 2008). Not only will the customer be enabled to access the foodservice environment via these methods, but they will be enabled to pay for the service via the above technological methods (NACUFS, 2008).
- Food is an increasing trend in and of itself. Menus are increasingly being developed to include the authentic, ethnic food rather than the generic substitute utilized for many years (NACUFS, 2008). In comparison to the other emerging trends this trend has the potential to be slower due to the overshadowing of more emergent influential trends (NACUFS, 2008).

Trends affecting the college foodservice environment are extremely influential upon the customer's choices and dollars spent within a location. Successful foodservice managers will embrace the upcoming and current trends and utilize them for the success of their environments.

## **Defining LEED**

Leadership in Energy and Environmental Design (LEED) is an internationally recognized building certification system developed by the United States Green Building Council (USGBC). LEED is third-party verification that a building was designed and built using strategies aimed at improving the environment (USGBC, 2010). The use of the LEED program should help to improve performance in energy savings, water efficiency, carbon dioxide emissions reduction, improved indoor environmental quality, and improved awareness of the environment and the effects of our actions. (USGBC, 2010). LEED is a program that can provide owners a framework for identifying and implementing practical and measurable building design, construction, operations and maintenance solutions to improve our environment (USGBC, 2010).

LEED is able to be applied to multiple building types. The USGBC has developed LEED to accommodate commercial and residential projects throughout the building lifecycle (USGBC, 2010). Designing, construction, outfitting for the user and large renovations are all included within the building lifecycle. LEED has grown beyond its initial beginnings and now offers programs for the residential areas (USGBC, 2010). LEED for homes focuses on the location and linkages of the neighborhood environment and the awareness and education of the public concerning areas of environmental concern (USGBC, 2010).

LEED measures seven different areas. The areas include: sustainable sites, water efficiency, energy and atmosphere, material and resources, indoor environmental quality, innovation in design, and regional priority (USGBC, 2010). LEED awards points in their program to signify compliance with the above listed areas. The points are awarded on a 100-point scale and credits are weighted to reflect their potential impact on the environment (USGBC, 2010). A project must satisfy all prerequisites and earn a minimum number of points to be certified. The levels of achievement include LEED certified, LEED certified silver, LEED



certified gold, and LEED certified platinum (USGBC, 2010). See Figure 1, USGBC LEED for Commercial Interiors chart for further clarification of the point breakdown for certification.

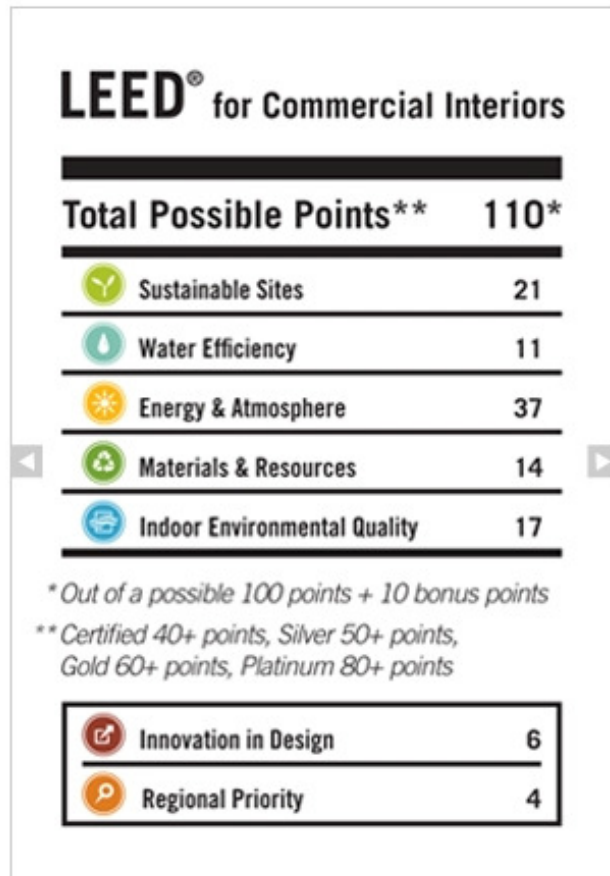


Figure1, USGBC LEED for Commercial Interiors Point Chart

**LEED and the campus influence**

LEED certification remains the most recognizable symbol of green facilities. LEED is branching out as a program and increases the awareness of “good design”. In 2001 there were 5 LEED certified projects for new construction. By October 2004 there were 162 with 1614 projects seeking LEED certification upon their completion (SCUP, 2005). USGBC started with

new construction LEED certifications, and now it is promoting criteria for certifying existing buildings, commercial interiors, core and shell projects, and even residential certification in the form of neighborhood areas labeled as LEED certified (SCUP, 2005).

Based on the founding principles of being the social center of campus, the student union can be a living model for all of sustainable design. A student union that is LEED certified provides yet another working “tangible model” for the university community to experience. There is a raised awareness of sustainability and the impact the student union, in turn, has on the larger world can influence more than the footprint of the building or the university’s skyline. Buildings affect everyone and everything, from the extraction of raw materials from the environment to the way that the building interacts with the area in which it is built. There are many ways to incorporate sustainability within the student union and in turn other buildings in the campus environment. Ways to incorporate sustainability, for example, include utilization of educational programming, simple changes in products used for dining services, cleaning products, and even further when constructing or renovating a building (Willis, 2005).

With a minimum of 40 points needed to achieve LEED certification and 21 of those coming naturally from good design simply from the building’s location, program and requirements of owner or local codes, 19 additional points are typically available for a minimum of effort (Willis, 2005). Institutions might put forth that minimum effort to acquire those higher levels of certification to receive the added benefits of serving as an example to peer institutions, the academic field, and the community aiming to provide a sustainable future (Willis, 2005).

Oklahoma State University (OSU) is currently undergoing a student union renovation. The renovation is striving to attain silver certification under the LEED program. The completed renovation of the student union will promote the “tangible” LEED model for all who encounter the OSU student union. University Dining Services (UDS) at OSU is organized with the administrative component located within the student union. The student union serves as a hub for

all administrative directives, human resources, payroll, marketing, and meal plan signups. The offices are physically located within the student union. The renovation of the student union will enhance each of the mentioned components of UDS. However, these areas do not totally comprise UDS. Satellite foodservice concepts are located in various locations across campus. The satellite concepts enable UDS to provide service to a larger portion of the higher education population. The services provided at the satellites accounts for a large part of revenue generated via the dining program. The current satellite operations are not LEED compliant. The purpose of this study is to propose a remodel using the LEED program for one of the satellite areas. The study will demonstrate not only the importance of the satellite operation, but also more ways to achieve LEED certification. Much like the student union's importance to the student body, the satellite components are integral as they can reach a portion of the student body that the student union may not reach.

Analysis of the OSU dining program signifies a desire to become more environmentally friendly. University Dining Services (UDS) in the past year has implemented tray-less Tuesdays to decrease the amount of water used for the purposes of dishwashing of trays and utensils within the foodservice establishment. Within the past two years UDS has opened a dining area with the concept entitled "Roots" that only serves their products on items that are recyclable and create a minimal carbon footprint. For example, the cups and "to go" containers are all made of products that are decomposable, leaving minimal trace in the landfill. Upon discussion with the foodservice manager of "Roots" the products are actually cheaper than the products previously used for carrying convenience. These two changes lend themselves to the next step, creating a built environment that will be recognized as an example of sustainability to the college community and the local society. The student union renovation will be a great accomplishment and help raise OSU to a level of sustainable recognition within the college community, and local

community. The renovation of additional foodservice facilities across campus will only increase the sustainable accomplishments of UDS at OSU.

## CHAPTER III

### METHODOLOGY

#### **Methodology**

The analyzation for the study of LEED for a foodservice environment will be done in four phases. The four phases include Programming, Analysis of LEED credits for project, Schematics, and Design Development. Each phase is important in the analysis of the foodservice environment and the LEED program. Below are further explanations about the phases of the design process.

#### **Programming**

One of the first components of the programming phase is to analyze the current conditions of the environment and the client. The client is the Little Bakery and Deli within Scott Parker Wentz dining hall on the Oklahoma State University campus. The initial analyses will include building measurements, interviews with the dining hall manager, and analyses of the physical condition of the dining area. The physical condition includes a review of the building materials, electrical, existing lighting, HVAC, furnishings, fixtures, and equipment within the space. Interviewing the dining hall manager helps to establish the short term and long term

forecasted plans for the space. The programming information will be used to design a floor plan of the current conditions of the space.

### **Analysis of LEED credit**

Analyzing the LEED criteria will follow the programming phase. This will allow for the determination of the most effective components of the LEED program that can be used in conjunction with the goals and objectives of the client and the needs of the Little Bakery and Deli. The goal of the project will be to attain at least LEED certified status. LEED certified status can best be defined as meeting the minimum requirements of the LEED program. The point totals to attain LEED certified are 40 + points (Table 2). Satisfaction of LEED credits will be analyzed and researched to find the categories within LEED that can be implemented to meet the goals and objectives of the client.

### **Schematic Design**

The schematic design phase includes synthesizing the programming and LEED analysis information and begins to design the space to meet the client's goals and objectives. The programming information will be combined with photo documentation of the dining areas, kitchen preparatory areas, and the storage facilities to compile an adjacency matrix to identify the needs of a renovation of the Little Bakery and Deli. Upon completion of the adjacency matrix and bubble diagrams the design concept can be determined. The design concept will help drive the overall design development phase.

### **Design Development**

The design development phase utilizes all the information gathered from the previous phases to develop an initial design for the client. Space planning, material selection, equipment selections and presentation drawings will be created within the design development phase. The

design concept, goals and objectives of the client, and LEED criteria are taken into great consideration to produce the design development package. See Figure 2, Evidenced Based Design Process Chart for a visual of the design process. Each of the phases combined are integral components of the design process package which will lead to the end product for the client.

Table 1.1 Design Process							
Design Process Phases	Programming		Schematic (Concept) Development	Design Development	Contract Documentation	Contract Administration	
	Initial contact with client	Programming			Implementation Take action		
Scope of services and/or tasks	Recognize problem	Define problem	Continue to analyze facts	Select and refine	Bidding process	Order/ construction	Evaluate
	Commit to project	State the goals and objectives	Generate ideas and brainstorm	Develop drawings, details, specifications	Construction drawings	Ordering process	Create punch list during walkthrough
	Accept the project	Gather information: the facts	Sketching of ideas, plans, details, etc.		Specifications written	Construction	
	Contract written	Interview clients, use surveys, questionnaires, conduct observations, etc.	Develop preliminary plans			Supervision	After approximately three months, conduct POE
	Retainer obtained	Research to develop a strong evidence base Analyze facts Organize the information and develop program requirements Continue to analyze facts					
	Analysis			Synthesis			

**Figure 2, Evidenced Based Design Process Chart**

## CHAPTER IV

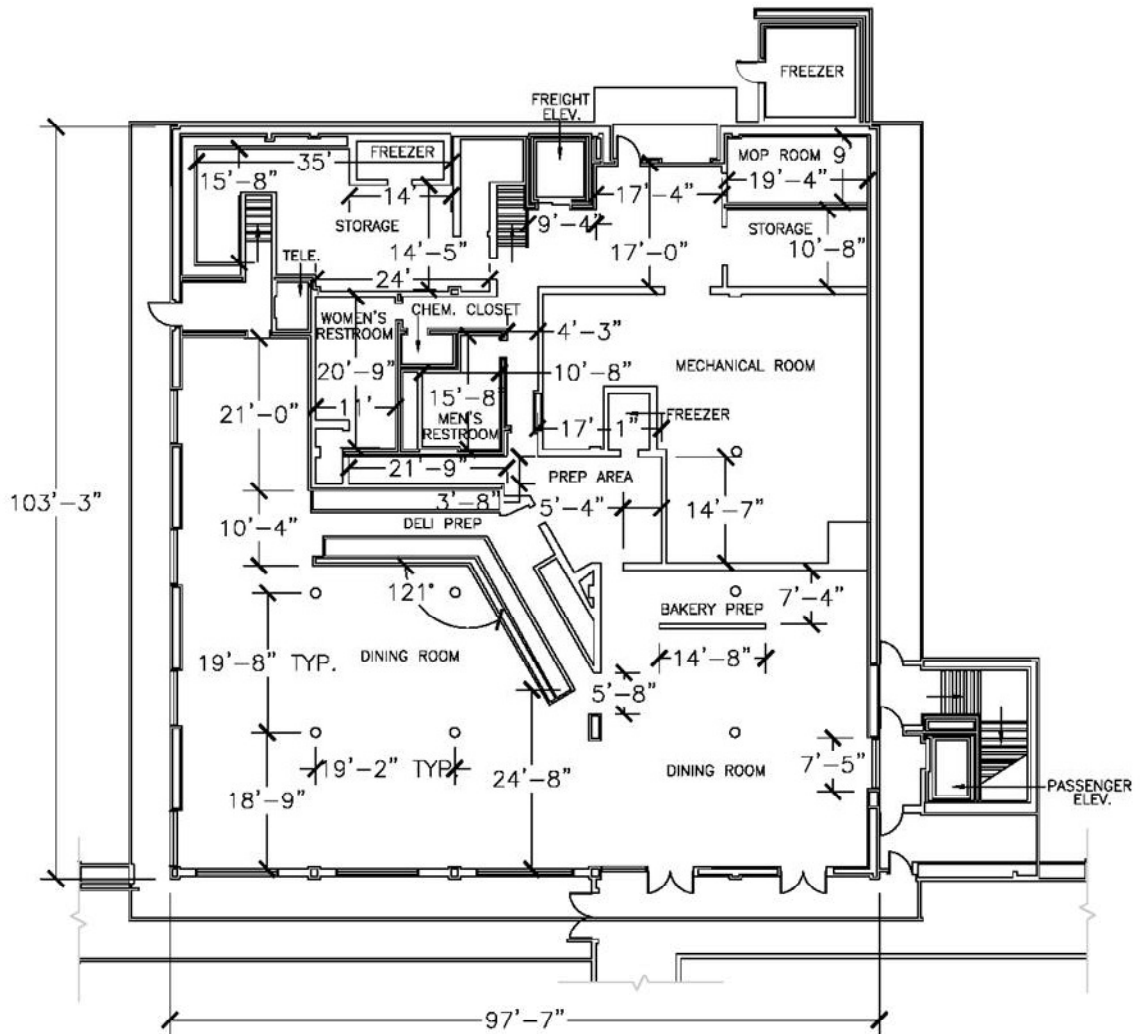
### RESULTS

The process of the results chapter explains the proposed design in accordance with the four Methodology phases: Programming, Analysis of LEED credit, Schematic Design, and Design Development. The next chapter will examine the proposed design and its compliance with LEED performance areas towards the goal of attaining a LEED certified case study project.

#### **Phase I: Programming**

This section provides the foundation for the design process. All physical attributes of the space were taken into account in order to create a dimensioned base plan of the space. See Figure 3, First Floor Base Plan to view the current floor plan with annotations. The physical conditions of the space were identified and recorded via photographs. See Appendix A for photos and documentation of area. The photos were helpful to establish the current concepts within the space, their adjacencies, and serve as a recording purpose for the programming portion. Equipment, furnishings and fixtures were inventoried to identify reusable materials for the space. See Appendix B for First Floor Equipment Inventory and Notes. Due to the design component affecting only the first floor, the first floor equipment only is shown. Materials that will be reusable are addressed in the Analysis of LEED Credit phase.



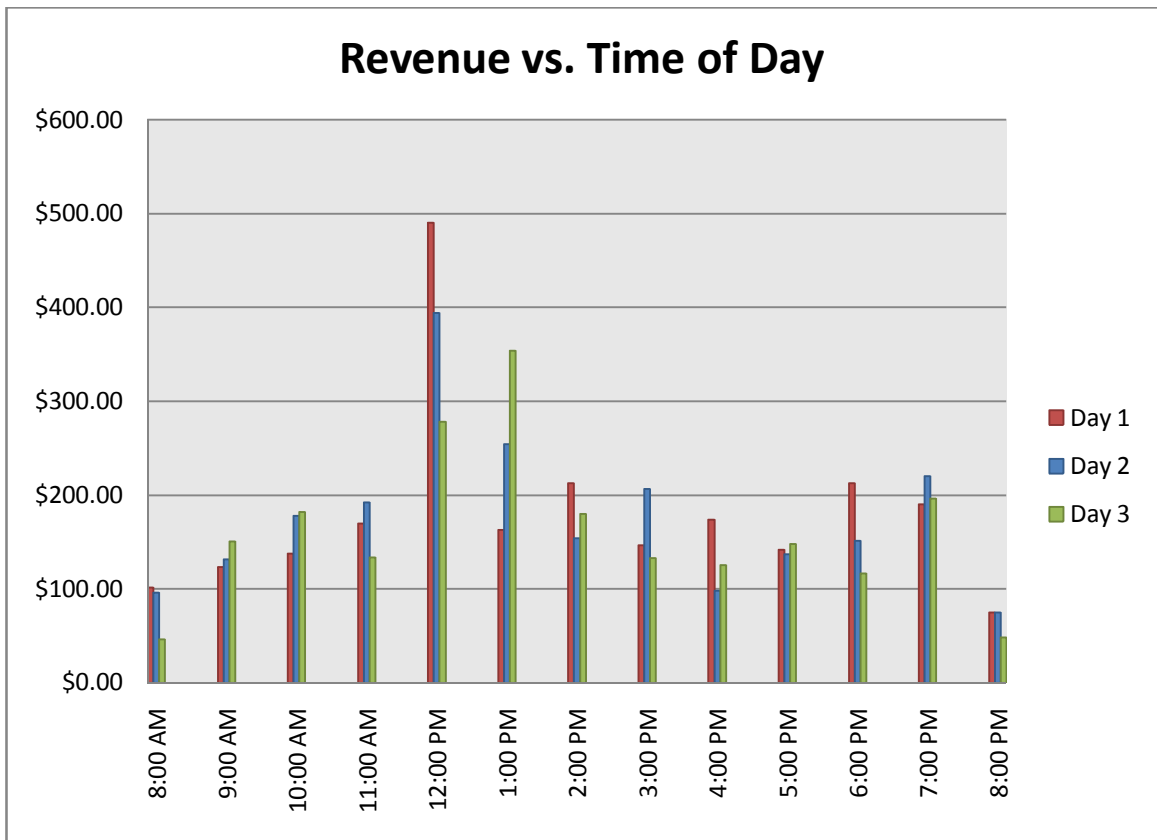


**Figure 3 First Floor Base Plan, not to scale.**

### Clientele Needs

Interviewing the dining hall manager helped to identify the client's needs in regards to equipment, storage, work space, future goals for space, sustainability concerns, and lighting needs for the renovation. During the interview many design needs were addressed. Within that discussion there were three prominent needs identified. The client would like to see the addition

of a public restroom and manager office on the first floor, flexible furniture to adjust to the changing needs of the environment, and a cohesive design aesthetic within the environment. Via the interview with the manager revenue reports were made available so that the flow of customers within the space could be recorded. Three random days were selected from the Spring 2010 semester. Information gained from the interview and the revenue reports provided information that can show the current customer behaviors that illustrate peak business moments, and the amount of users within the space. Table 1 illustrates the amount of revenue generated at certain times during the day.



**Table 1 Revenue vs. Time of Day**

**Phase II: Analysis of LEED Credit**

After the conclusion of the programming phase, a better understanding of the current facilities and the needs of the facility were attained. Before the schematic design phase was

conducted an analysis of the LEED credit possibilities was assessed. Using the resources that were available from the USGBC a LEED criteria checklist was obtained via the website. The USGBC website also provided a LEED guidebook for Commercial Interiors that was helpful to explain the components of the LEED checklist. These materials and materials from the National Association of College and University Foodservices (NACUFS) were utilized to help determine the most plausible LEED credits to attempt achieving at least a LEED certified status. Upon completion of the checklist I gained the insight of a National Council for Interior Design Qualifier (NCIDQ) registered Interior Designer and LEED Accredited Professional (AP). The LEED AP went through the checklist to help narrow down the most efficient and effective methods for meeting the criteria under the scope of the project. See Figure 5 for the LEED checklist completed.

A true LEED project has a process it must follow in order to be qualified as a LEED project. The project must be registered with the USGBC and fees are to be paid per certification status desired and proper documentation submitted. Another requirement for the project is the involvement of a LEED AP in the project. The involvement of a LEED AP individual will gain the project a point for their involvement, and this is a requirement for the project from the beginning. I consulted a LEED AP for verification of the components of the LEED program.

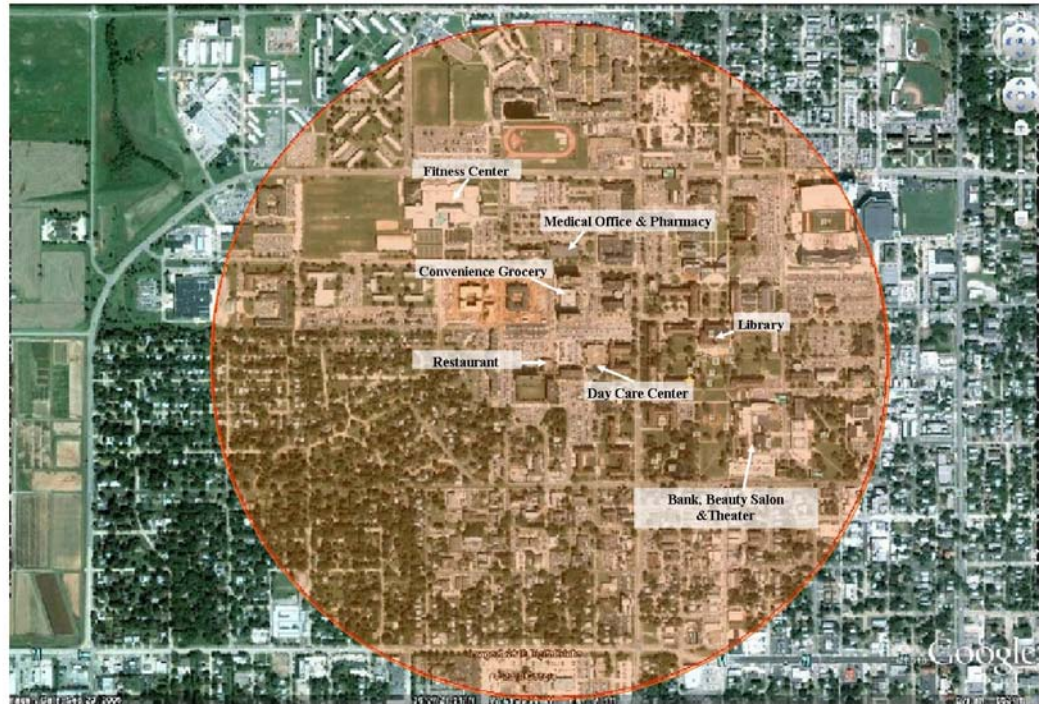
The purpose of this project was not only to renovate the dining center in accordance with the needs of the customers and UDS, but to renovate the space in accordance with the LEED rating system with the goal of attaining certified status. The final design proposal encompasses the intent of each of these performance areas by the design methods, systems, and materials specified. This section will examine, via the categories of the LEED checklist, what sustainable implications could be assessed if the proposed design was implemented.

## Sustainable Sites

Credits within the sustainable sites category can be met through the following paths as outlined in the LEED for Commercial Interiors handbook:

- Credit 1, Path 7: Water Efficient Landscaping-Reducing by 50%: Creation of gardens that are watered via collected rainwater that is pumped via a solar pump from the underground tanks can reduce conventional means for watering a garden or landscape areas. (2 points)
- Credit 1, Path 8: Water Efficient Landscaping-No Potable Water Use or Irrigation: Collecting rainwater in an underground tank and collecting water condensation from air conditioning units is a method to collect non potable water onsite. The use of a solar pump to use the water for irrigation purposes decreases the energy used for this process and utilizes non potable water for the care of the landscape. Incorporating native plants that are adaptive to the climactic conditions reduces the need for additional irrigation. (2 points in addition to Path 7).
- Credit 1, Path 10: Water Use Reduction: 30% Reduction: Incorporation of low flow sprayers in the dishwashing areas, low flow water toilets, waterless urinals, and changes in practices in kitchen preparation areas will reduce the water use of the dining facility. During the interview the foodservice manager stated that he would be open to changing everyday practices and procedures and attend and train employees concerning sustainable measures. This dedication will change the practices of the facility in regards to water usage and can reduce this for future purposes. Incorporating training procedures and educating the employee can influence current and future employees in their water use practices. (1 point)

- Credit 2, Option 2: Community Connectivity: Building is located within ½ mile radius of at least 10 of the basic services listed in the LEED Commercial Interiors handbook. See Figure 4 to view the basic services located within ½ mile of the project site. (6 points)



**Figure 4, ½ mile radius services**

- Credit 3.1, Option 2: Bus Stop Proximity: Project is located within ¼ miles walking distance of 2 public campus bus routes. (6 points)
- Credit 3.2: Alternative transportation-Bicycle storage and changing rooms: Secure bicycle storage is provided for the occupants. Showers and changing facilities were incorporated into the restroom design. The showers are within the 200 yards of the building entrance and are for the use of employees and customers. (2 points)
- Credit 3.3, Option 2: Alternative transportation-Parking Availability: No new parking is being created for this project. (2 points)

Total potential points for the sustainable sites category using the above outlined methods total 21 points.

## **Water Efficiency**

Credits within the water efficiency section can be met through the following paths as outlined in the LEED for Commercial Interiors handbook:

- Prerequisite 1: Water Use Reduction-20%: The incorporation of low flow commercial toilets, waterless urinals, low flow water faucets, and low flow commercial pre-rinse spray valves for dishwashing uses will decrease water usage in the dining facility. (No points as this is a requirement)
- Credit 1: Water Use Reduction: Not including irrigation fixtures and fittings and appliances outside the scope of water use reductions, 30% of the water use can be reduced. Water reduction can occur through the current practice of Tray less Tuesdays, low flow toilets, waterless urinals, and low flow pre-rinse spray valves. (6 points)

Total potential points for the water efficiency category using the above outlined methods total 6 points.

## **Energy and Atmosphere**

Credits within the energy and atmosphere section can be met through the following paths as outlined in the LEED for Commercial Interiors handbook:

- Prerequisite 1: Fundamental Commissioning of Building Energy Systems: Within the initial stages of the project a commissioning authority can become part of the design team to insure that LEED practices and plans are implemented into the construction documents, plans, and performance systems and complete a commissioning report. (There are no points as this is required.)
- Prerequisite 2: Minimum Energy Performance: 50% of the equipment installed for the facility needs to be Energy Star qualified. New equipment specified will meet the Energy star requirements. (There are no points as this is required)

- Prerequisite 3: Fundamental Refrigerant Management: Absolutely no chlorofluorocarbon (CFC) based refrigerants are to be used in the equipment, ventilation, and air conditioning. (There are no points as this is required)
- Credit 1.2: Optimize Energy Performance-Lighting Controls: Daylight controls for day lit areas, controls for 50% of the lighting load, and occupancy sensors will achieve the conditions of this credit. (3 points)
- Credit 1.4: Optimize Energy Performance-Equipment and Appliances: The Energy Star equipment will achieve at least 70% energy conservation within the unit. (1 point)
- Credit 3: Measurement and Verification: A mechanical engineer with a specialization in Heating, ventilation, and air conditioning (HVAC) was not consulted for this project. Through their potential incorporation in the project they could outline equipment that will measure and record energy within the space. The current energy costs are paid by the tenant in addition to their base rent for the space to the university via overhead costs. (5 points)

Total potential points for the energy and atmosphere category using the above outlined methods total 9 points.

### **Materials and Resources**

Credits within the materials and resources section can be met through the following paths as outlined in the LEED for Commercial Interiors handbook:

- Prerequisite 1: Storage and Collection of Recyclables: The proposed design incorporates the use of recycling area for materials such as paper, glass, plastics and metals. The facility currently recycles cardboard products. (There are no point as this is required)

- Credit 1.1: Tenant Space-Long Term Commitment: According to the manager of the facility University Dining Services will occupy the space for a minimum of the next ten years. (1 point)
- Credit 1.2: Building reuse-maintain interior nonstructural components: 40% of the current interior structure will be reused for the new design. Examples of areas that will be maintained include exterior walls and their finishes as well as a majority of the windows. (1 point)
- Credit 2: Construction Waste Management: Coordination with the general contractor for the project and work to divert construction waste and demolition debris from the landfill and incineration facilities. A program will be arranged to offer finish materials that can be reused to local social programs and individuals for their own use. Trucks that will be carrying products to the landfills will be weighed. Recording the products that are donated and those sent to the landfills will demonstrate the amount that is diverted. (2 points)
- Credit 3.1: Materials Reuse: 5% of the materials associated with the project cost can be reused in the new design proposal. Materials for reuse include office furniture and beverage dispensing equipment. (1 point)
- Credit 5, Option 2: 10% of the combined value of construction and furniture (Division 12) materials and products are extracted and produced within a 500 mile radius of the project. Those specific finish items include flooring materials and countertops. (2 points)
- Credit 6: Rapidly Renewable Materials: Incorporation of rapidly renewable material such as cork flooring can meet this credit. (1 point)

Total potential points for the materials and resources category using the above outlined methods total 8 points.



## Indoor Environmental Quality

Credits within the Indoor Environmental Quality section can be met through the following paths as outlined in the LEED for Commercial Interiors handbook:

- Prerequisite 1, Case 1: Minimum Indoor Air Quality Performance: Through the incorporation of a mechanical engineer specializing in HVAC this credit can be achieved. (There are no points as this is required)
- Prerequisite 2, Option 1: Environmental Tobacco Smoke (ETS) Control: Due to the fact that Oklahoma State University is a non smoking campus there is not a threat of tobacco smoke interference with the facility. (There are no points as this is required)
- Credit 4.1: Low-Emitting Materials-Adhesives and Sealants: All adhesives utilized for the interior of the renovation will be comprised of low emitting volatile organic compounds (VOC). (1 point)
- Credit 4.2: Low-Emitting Materials-Paints and Coatings: Floor coatings and paints will be comprised of low VOC materials. (1 point)
- Credit 4.3, Option 1: Low-Emitting Materials-Flooring Systems: Bamboo wood flooring will be comprised of low VOC materials to minimize off gassing in the environment during the renovation (1 point).
- Credit 4.4: Low-Emitting Materials: Composite Wood and Agrifiber Products: Products used on the interior of the facility are to have no added urea-formaldehyde resins. Adhesives associated with the composite wood and agrifiber products will have no added urea-formaldehyde resins. (1 point)
- Credit 4.5, Option 1: Low-Emitting Materials-Systems Furniture and Seating: All furniture and seating that are selected are Greenguard Indoor Air quality Certified. (1 point)

Total potential points for the indoor environmental quality category using the above outlined methods total 5 points.

### **Innovation and design Process**

Innovation in Design is a category that can be achieved by going above and beyond methods outlined in the LEED for Commercial Interiors handbook as methods achieve exceptional performance for LEED. Three potential innovation and design opportunities for this particular study involve the use of the products from the gardens grown, food waste removal within the facility, and educational components for customers and staff. The first potential innovation from the garden aspect is to grow products in the gardens that can be utilized in the foodservice facility. This would give the facility the ability to grow on site, customers would be able to witness to the product growth process, and provide another point of interest for the facility. Areas of concern associated with this particular innovation are the maintenance of the garden and the financial impact this may have to the facility food budget.

The second innovation technique involves utilizing food waste as a compost product. OSU currently does not have a university compost site and does not collect the food waste for this purpose. Incorporation of the food wastes for compost use could be utilized in the garden at the facility and in turn creates a tangible cyclical image of the food process for the customer. Food transparency is an important and upcoming trend for the college foodservice environment. Incorporating the use of the compost and garden on site allows the customer a tangible model for this process.

Lastly, another opportunity for Innovation and Design is an educational component. To increase education about the LEED program and the benefits of the program, an educational wall is designed for the space. This will allow for a point of interest within the facility and educate the customer of the space and the employees within the space about the LEED program. Areas that

have utilized a sustainable measure will also have a small sign informing the user of the space about the specific finish or practice undertaken to enhance their surroundings.

Should the three options for innovation be approved this would be a potential of 3 points for the Innovation and Design category.

### **Regional Priority Credits**

Regional priority credits (RPC), according to the USGBC, are credits introduced in the LEED 2009 rating systems to incentivize the achievement of credits that address geographically specific environmental priorities. RPCs are not new LEED credits, but instead are existing credits that USGBC chapters and regional councils have designated as being particularly important for their areas. The incentive to achieve the credits is in the form of a bonus point. If an RPC is earned, then a bonus point is awarded to the project's total points. Each specific area, referenced by zip code, has six RPCs per rating system. A project may earn up to four bonus points as a result of earning RPCs, with one bonus point per RPC. Upon project registration, LEED Online automatically determines a project's RPC based on the zip code. If the project earns an RPC, it will also earn the associated bonus point (USGBC, 2010).

Based upon the zip code for the project there are six points available for the project. One of the credits that have been attained via the checklist qualify for the regional priority credit. Credit 2 of Materials and Resources, Construction Waste Management will gain an additional bonus point based on the RPC.

LEED 2009 for Commercial Interiors			Project Name: Scott Parker Wentz Dining, Oklahoma State University				
Project Checklist			Date: Summer 2010				
<b>21</b>	<b>Sustainable Sites</b>	<b>Possible Points: 21</b>	<b>5</b>	<b>Indoor Environmental Quality</b>	<b>Possible Points: 17</b>		
<input checked="" type="checkbox"/>	Credit 1	Site Selection	1 to 5	<input checked="" type="checkbox"/>	Prereq 1	Minimum IAQ Performance	
<input checked="" type="checkbox"/>	Credit 2	Development Density and Community Connectivity	6	<input checked="" type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control	
<input checked="" type="checkbox"/>	Credit 3.1	Alternative Transportation—Public Transportation Access	6	<input type="checkbox"/>	Credit 1	Outdoor Air Delivery Monitoring	1
<input checked="" type="checkbox"/>	Credit 3.2	Alternative Transportation—Bicycle Storage and Changing Rooms	2	<input type="checkbox"/>	Credit 2	Increased Ventilation	1
<input checked="" type="checkbox"/>	Credit 3.3	Alternative Transportation—Parking Availability	2	<input type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan—During Construction	1
<input checked="" type="checkbox"/>	Credit 3.3	Alternative Transportation—Parking Availability	2	<input type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
<b>6</b>	<b>Water Efficiency</b>	<b>Possible Points: 11</b>	<input type="checkbox"/>	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1	
<input checked="" type="checkbox"/>	Prereq 1	Water Use Reduction—20% Reduction		<input checked="" type="checkbox"/>	Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
<input checked="" type="checkbox"/>	Credit 1	Water Use Reduction	6 to 11	<input checked="" type="checkbox"/>	Credit 4.3	Low-Emitting Materials—Flooring Systems	1
<b>9</b>	<b>Energy and Atmosphere</b>	<b>Possible Points: 37</b>	<input checked="" type="checkbox"/>	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1	
<input checked="" type="checkbox"/>	Prereq 1	Fundamental Commissioning of Building Energy Systems		<input checked="" type="checkbox"/>	Credit 4.5	Low-Emitting Materials—Systems Furniture and Seating	1
<input checked="" type="checkbox"/>	Prereq 2	Minimum Energy Performance		<input type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Source Control	1
<input checked="" type="checkbox"/>	Prereq 3	Fundamental Refrigerant Management		<input type="checkbox"/>	Credit 6.1	Controllability of Systems—Lighting	1
<input checked="" type="checkbox"/>	Credit 1.1	Optimize Energy Performance—Lighting Power	1 to 5	<input type="checkbox"/>	Credit 6.2	Controllability of Systems—Thermal Comfort	1
<input checked="" type="checkbox"/>	Credit 1.2	Optimize Energy Performance—Lighting Controls	1 to 3	<input type="checkbox"/>	Credit 7.1	Thermal Comfort—Design	1
<input checked="" type="checkbox"/>	Credit 1.3	Optimize Energy Performance—HVAC	5 to 10	<input type="checkbox"/>	Credit 7.2	Thermal Comfort—Verification	1
<input checked="" type="checkbox"/>	Credit 1.4	Optimize Energy Performance—Equipment and Appliances	1 to 4	<input type="checkbox"/>	Credit 8.1	Daylight and Views—Daylight	1 to 2
<input checked="" type="checkbox"/>	Credit 2	Enhanced Commissioning	5	<input type="checkbox"/>	Credit 8.2	Daylight and Views—Views for Seated Spaces	1
<input checked="" type="checkbox"/>	Credit 3	Measurement and Verification	2 to 5	<b>3</b>	<b>Innovation and Design Process</b>	<b>Possible Points: 6</b>	
<input checked="" type="checkbox"/>	Credit 4	Green Power	5	<input checked="" type="checkbox"/>	Credit 1.1	Innovation in Design: Specific Title	1
<b>7</b>	<b>Materials and Resources</b>	<b>Possible Points: 14</b>	<input checked="" type="checkbox"/>	Credit 1.2	Innovation in Design: Specific Title	1	
<input checked="" type="checkbox"/>	Prereq 1	Storage and Collection of Recyclables		<input checked="" type="checkbox"/>	Credit 1.3	Innovation in Design: Specific Title	1
<input checked="" type="checkbox"/>	Credit 1.1	Tenant Space—Long-Term Commitment	1	<input checked="" type="checkbox"/>	Credit 1.4	Innovation in Design: Specific Title	1
<input checked="" type="checkbox"/>	Credit 1.2	Building Reuse	1 to 2	<input type="checkbox"/>	Credit 1.5	Innovation in Design: Specific Title	1
<input checked="" type="checkbox"/>	Credit 2	Construction Waste Management	1 to 2	<input type="checkbox"/>	Credit 2	LEED Accredited Professional	1
<input checked="" type="checkbox"/>	Credit 3.1	Materials Reuse	1 to 2	<b>1</b>	<b>Regional Priority Credits:</b>	<b>Possible Points: 4</b>	
<input checked="" type="checkbox"/>	Credit 3.2	Materials Reuse—Furniture and Furnishings	1	<input checked="" type="checkbox"/>	Credit 1.1	Regional Priority: Specific Credit	1
<input checked="" type="checkbox"/>	Credit 4	Recycled Content	1 to 2	<input type="checkbox"/>	Credit 1.2	Regional Priority: Specific Credit	1
<input checked="" type="checkbox"/>	Credit 5	Regional Materials	1 to 2	<input type="checkbox"/>	Credit 1.3	Regional Priority: Specific Credit	1
<input checked="" type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1	<input type="checkbox"/>	Credit 1.4	Regional Priority: Specific Credit	1
<input checked="" type="checkbox"/>	Credit 7	Certified Wood	1	<b>52</b>	<b>Total</b>	<b>Possible Points: 110</b>	

Figure 5, Project LEED Checklist.

### Phase III: Schematic Design

The schematic design phase included taking the programming and LEED analysis information and begins to design the space to meet the client’s goals and objectives. The programming information was combined with photo documentation of the dining areas, kitchen preparatory areas, and the storage facilities. Once all the information was gathered an adjacency matrix was created to identify the needs of a renovation of the space. Via the use of the adjacency matrix, bubble diagrams were created to show relationships within the space. Once all the information was gathered an adjacency matrix was created to identify the needs of a renovation of the space. Via the use of the adjacency matrix, bubble diagrams were created to show relationships within the space. These instruments lead to the initial sketch images for the floor plan.

## **Design Charette**

Utilizing the programming and LEED analysis information is important to the schematic design phase. To further enhance the initial design of the space other methods can be employed to strive for the optimal design solution. A design charette was chosen to conduct with the employees of the dining center. The employees were randomly assigned into groups, were given a floor plan with the exterior walls, mechanical space, and other integral structural components within the plan. Within their groups they were given twenty minutes to draw their vision of an ideal first floor. See Figure 8 for the images of the charette. Once the time was completed, the employees were asked to share with the entire group their ideas. The group consensus of needs for the space included the addition of a public restroom, manager office in the space, the ability to fill beverages from the Back of House (BOH) so as not to interfere with the Front of House (FOH) service, and open up the space to allow more ample work areas and the customers the opportunity to smell the items being prepared. See Appendix D for IRB Documents approving the design charette. The design charette coupled with the programming phase and LEED analysis will lead to the initial sketch images for the floor plan. See Figure 6 for the initial floor plan sketches.

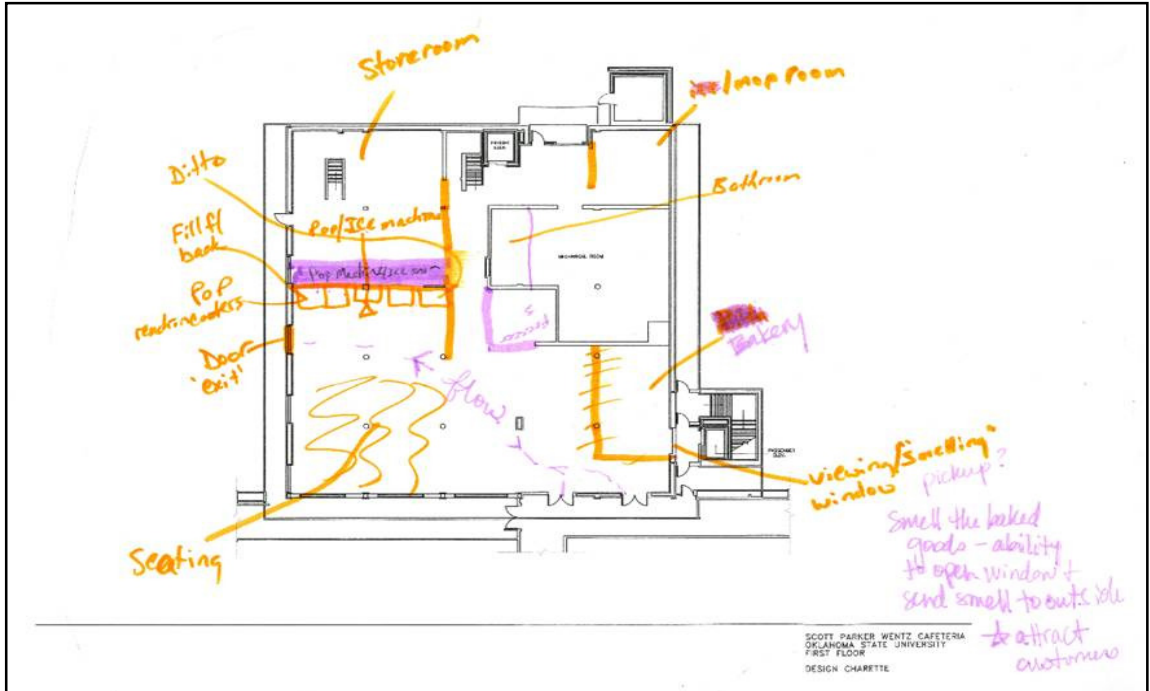


Figure 8, Design Charette Images

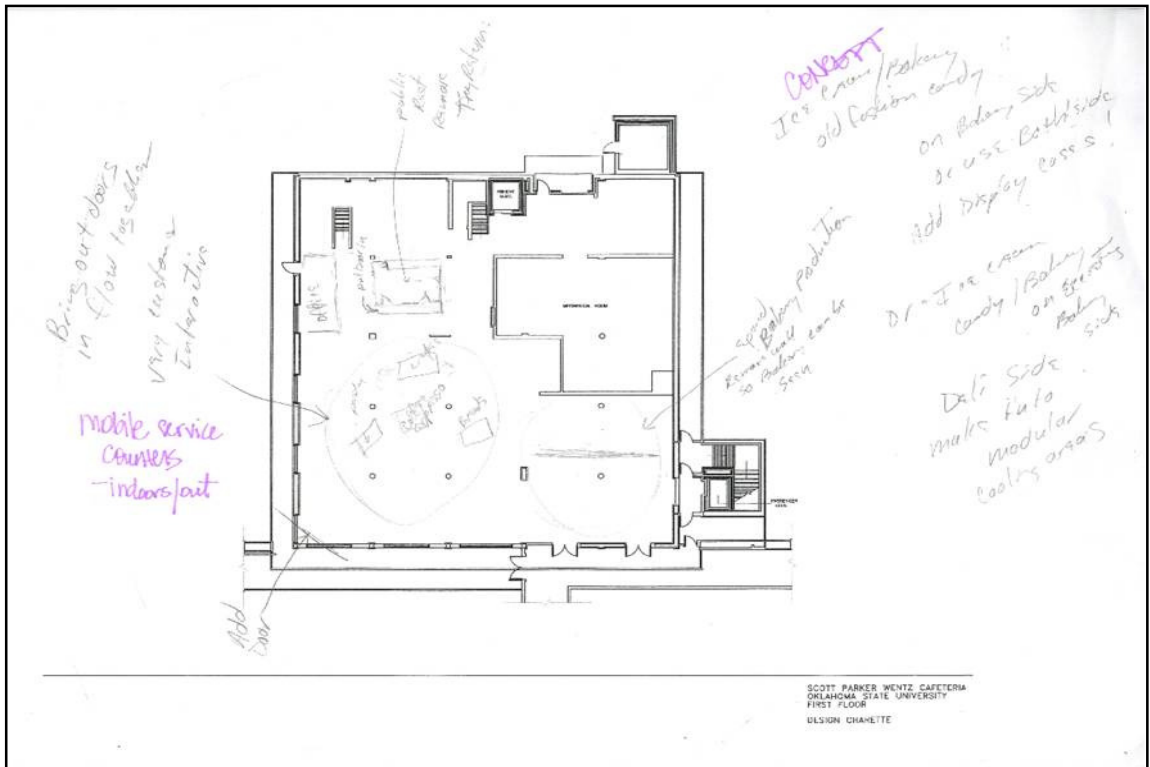


Figure 8, Design Charette Images

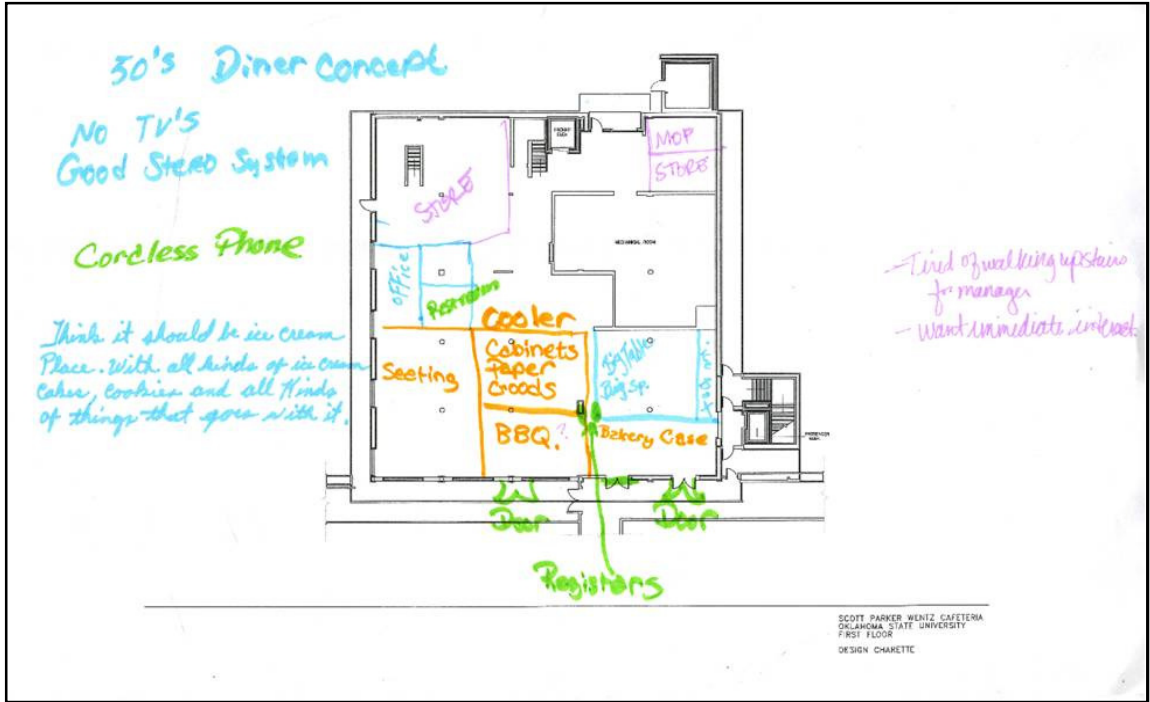


Figure 8, Design Charette Images

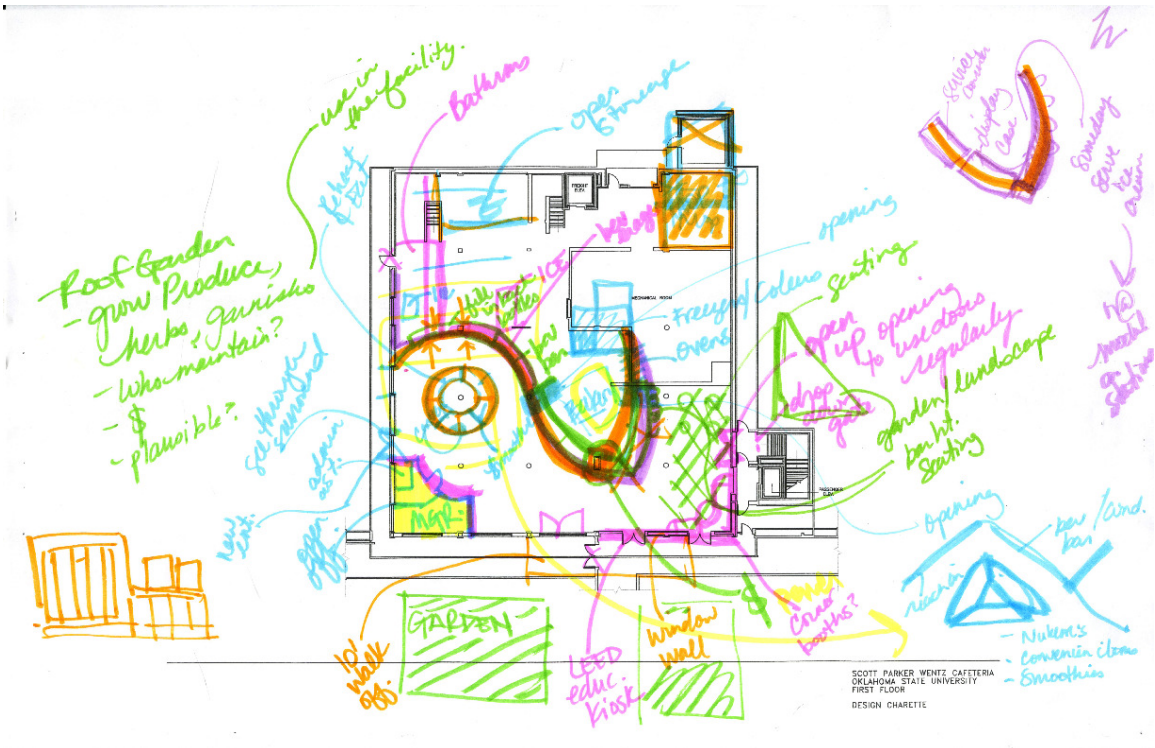


Figure 6, Initial Floor plan Sketches

## **Design Concept**

Utilizing the current and upcoming trends facing the foodservice environment and the information from interviewing the foodservice manager the concept for design is established. The overall image for the environment needs to include components such as: sustainable objects, transparency, neutrality, flexibility, cleanliness, and updated design features. The overall concept can best be described as something similar to a wave of the wind. The wind waves through this area of the country, through the land and over the fields. Wind is a renewable resource; it has a flexible nature, and a transparent quality. Wind can have fierceness and a gentleness to blow through an area to provide a sense of cleanliness to keep things moving and reduce stagnation. The concept, “Wave of Wind” can be reflected in the floor plan layout, and the finishes that will be used through the design. This concept encompasses the main goals of creating a sustainable environment that is flexible to the needs of the space.

## **Phase IV: Design Development**

The design development phase utilizes all the information gathered from the previous phases to develop an initial design for the client. See Figure 7, proposed updated floor plan. The design development phase incorporates each of the previous sections to propose the renovations. Specific finishes that will be utilized within the new design of the space are:

- bamboo flooring in the dining area which is a rapidly renewable resource,
- recycled tile produced within a 500 mile radius for the prep areas,
- low volatile organic compound (VOC) paint,
- furniture fabrics are Green Guard Indoor Air quality certified,
- solid surface made of recycled glass components and created within a 500 mile radius of the project site,
- toilet partitions made of recycled cardboard.



See Appendix C, Finish Sample board to view images of the finishes selected. The finishes are a few of the finishes selected for the reshaping of the space to conform to the needs of the client and the satisfaction of categories within LEED. Further finish items are described in the LEED analysis checklist

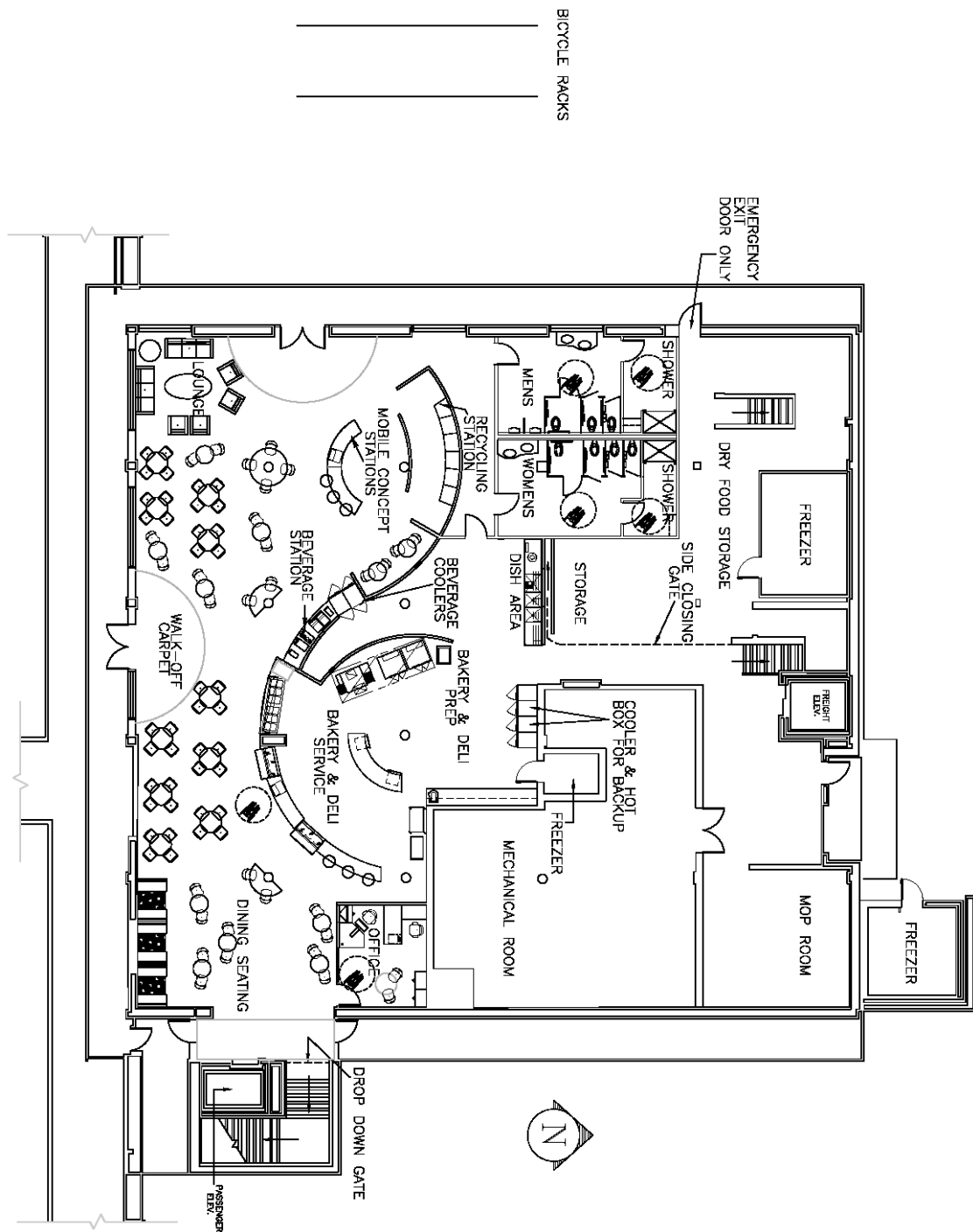


Figure 7, Proposed updated floor plan, not to scale

## CHAPTER V

### CONCLUSION

In conclusion, the final outcome of the design proposal and reviews of the sustainability implications that would occur if the proposed design was implemented are discussed. The chapter will first look at the overall design evaluation, the design elements, and their renovated effects upon the environment. Lastly, the LEED recommendations will be discussed and their impact for future uses.

#### **Design Evaluation**

The scope of this project included several goals and objectives, but there were some notable standout initiatives for improvement of the space. The overall goals for improvement of the space were the incorporation of flexible furniture and equipment to accommodate changing concepts within the dining center, include a public restroom and manager office on the first level, and provide a cohesive design for the first floor area. The design was able to accommodate many various items, but overall was able to satisfy the three main goals. The following sections identify the three main goals and explain of how each was satisfied.

#### **Incorporation of flexible furniture and equipment**

Flexible furniture and equipment is important to the space of the college dining environment given the current and upcoming trends facing this particular environment.

The foodservice manager, in an interview, stated that a dining concept can expect to change or evolve every 2-5 years within this particular environment. Given that knowledge it is imperative that the components are mobile, detachable and able to adopt chameleon like qualities for the business to adapt to the ever changing qualities of the campus foodservice environment. Flexible furniture was incorporated through the use of customized pieces. Mobile concept stations were designed to allow the dining center to use these areas regularly within the unit, but also have the ability to move the unit outside the dining center in a “street vendor” fashion. The mobile unit also gives the dining unit the flexibility to experiment with other concept ideas and menu options in a way that allows the station to be mobile.

Specifying mobile foodservice preparation equipment can increase the mobility of the items in the dining center. The decrease of built in equipment allows the space to change shape as the needs of the customer changes over time. For example, as opposed to a standard built in service counter with stationary heat and cold wells, the incorporation of the framework of the counter to allow mobile counters to be placed in this framework allows the space to transform. Similarly to office furniture systems, cubicle spaces, the service counter framework can incorporate electrical housing that will allow the product to utilize electricity in more than one location.

The mobile concept service stations, mobile preparation equipment, and service counter framework allow the environment to be transformable. Overall the incorporation of mobility and the lack of stationary equipment will allow the dining concept to move and change as the trends and needs of the campus dining facility evolve.

### **Public Restroom and Manager Office**

During the interview with the dining service manager a concern for the need to have a public restroom and a way for the administrative staff to have more access to the first floor of the

dining unit were expressed. Currently the dining center does have restrooms, but they are employee use only. The addition of a public restroom that allows employees and customers access provided the solution based upon the square footage and increased needs of the space. The proposed restroom will be used by both employees and customers. Employees will have an access door via the BOH areas to separate customers from the BOH areas. Sanitation regulations will be upheld through the incorporation of the restricted access point.

Currently the administrative staff office is on the second floor of the dining unit. This location puts the managerial individuals at a distance from the staff in the first floor space, and out of reach to address any customer concerns. Currently any individual that would like to visit the office area needs to pass through the BOH areas to reach the space. Allowing an individual that is not properly dressed for the foodservice environment increases their chances of interacting with food while it is being prepared and can increase cross contamination risk in the space. To solve the problem of allowing the administrative staff more access to the first floor is the addition of the managerial office in the first floor. The manager and the administrative assistant can move to this location to allow them more access to the staff and customers. This will allow the assistant manager and supervisors to stay within the current office. As defined by the interview with the manager, the assistant manager's responsibilities relate more to the BOH operations with regard to ordering, inventory, and procurement responsibilities. The manager is responsible for the overseeing of the assistant manager position, but also that of the revenue and labor components of the operation. Moving the manager to the first floor allows them to be at an easier access point for employees, potential new employees, and any customer interactions. The addition of the public restroom and the movement of the manager and administrative assistant to the first floor improve customer relations for the first floor area.

## **Cohesive design**

The current equipment, furnishings, and finishes in the first floor area are not cohesive with their concepts. The manager has stated that the area has evolved to meet the needs of the customer via the use of retrofitting equipment for the purposes of new ideas in the space. Equipment that is no longer in use via other satellite dining operations has been incorporated into the first floor concepts. The incorporation of the myriad of components has created a disjointed environment and does not sufficiently express the concepts of the area. Via the interview it was learned the finishes have been updated as needed when an issue has occurred, and as a quick fix to the environment.

To create a cohesive design, a few components were integral in accomplishing the task. Selecting a flooring material that coordinates between the spaces, selecting coordinating furniture materials, and equipment selection that is meant specifically for the needs of the concepts of the first floor allow a consistent image. Selecting materials in colors that are neutral allow for concepts to change as needed, and will decrease the disjointed and incomplete current look of the facility.

## **LEED recommendations**

Renovation of the space in accordance with the LEED rating system with the goal of attaining LEED certified status was one of the purposes of the study. The final design proposal achieved LEED silver rating. Per chapter four, LEED analysis section, the sustainable implications are assessed if the proposed design is implemented. Areas that could improve the LEED rating for this proposed project would be to create a team of various disciplines related to the design of the project. The incorporation of a landscape architect, mechanical engineer, electrical engineer, and architect can enhance areas within the checklist that are outside of the

scope of Interior Design. The knowledge of an integrated team approach could bring forth the possibility of a LEED Platinum level project.

The overall design improvements will improve the sustainability of the building design, increase the employee and customer comfort levels as well as meet the criteria set forth by LEED. Overall, the final proposed design addresses the needs of the space, employees, customers of the dining facility, and creates a great environmentally pleasing addition to the UDS department. Through the incorporation of the design improvements, LEED performance areas were met as outlined for the scope of the study

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## APPENDICES

**APPENDIX A**  
**First Floor Images**



First Floor Entrance



First Floor Entrance



Bakery Service Counter & Dining



Bakery Service Counter



Bakery Dining Area



Freshens Service Counter



Bakery Ceiling with visible sprinklers



Comment Station between concepts



Pretzel and Condiment corner in center of flow through concept on the way to cashier



Deli Cashier station



Deli Cold Service Counter, Unused Vent Hoods in Back of Photo



Dining Room Storage in Deli area



Dining Room view from Cashier position



Overall Dining Room View



Deli area Ceiling



Dining Room View back to Deli Cashier



Dining Room View



Exterior View from Deli Dining area



Bakery Prep Area



Exterior View from Deli Dining area



Prep Area BOH



Exterior View from Deli Dining corner



Fountain Syrup Storage, CO2 Storage



Prep Area Freezer, 3 compartment sink



Bakery Prep area 2<sup>nd</sup> compartment sink



Electric Box



Bakery Prep Equipment



Bakery behind Service Counter



Corridor Leading 2<sup>nd</sup> Floor Staircase, Men's Restroom Entrance to left of image



Bakery Prep area ceiling



Electric Box in Corridor



Bakery Prep equipment and ceiling



Mens Restroom Toilet, Lockers to left



Womens Restroom



Mens Restroom Vanity and Urinal



Entrance from Back Dock Door



Corridor to Womens Restroom, Chemical Room Door on left of image



Back Dock Storage Room, Mechanical Room Entrance





Mop Room, Ice Machine to left of image



Dry Storage Room Entrance



Back Dock area, Freight elevator to left, freezer and cooler storage to right of image, overhead rolling door in center of image



Dry Storage Room, Ceiling open to structure



Storage Room off of Dry Storage Room



Dry Storage under stair case



Dry Storage



Dry Storage looking back at entrance



Dry Food Storage



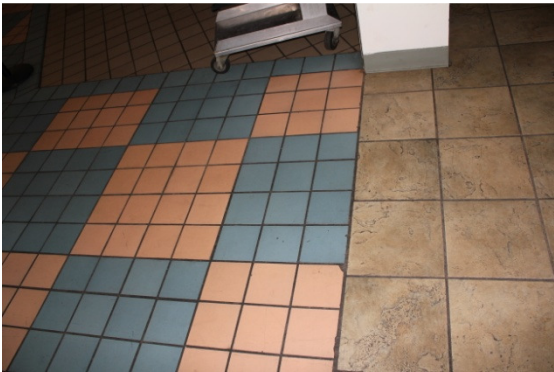
Dry Storage around stair case



Freezer in Dry Storage area



First floor masonry under windows and on east side of first floor area



Three different floor finishes



First floor paint color



Wireless Equipment, Building has WiFi for customer usage



Extra Equipment at back of first floor area,  
in front of emergency access door



Office Setup



Staircase behind emergency access door



Cardboard recycling container

**APPENDIX B**  
**EQUIPMENT INVENTORY-FIRST**  
**FLOOR**



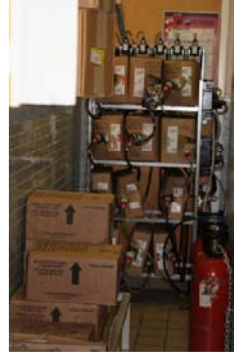
Back Dock, 3 Reach In Coolers, 2 Reach In Freezers, Energy Star Rated-Maintain in Facility



Dry Storage Room Freezer, Operational



Reach in Mobile Heat Box, Little Bakery Prep area, Operational



Fountain Syrup, CO2 containers, Provided through Beverage contract



Reach in Display Beverage Cooler, Little Bakery Prep area, converted to thaw smoothie products, Operational



Reach in/Cart Roll in Coolers, Little Bakery Prep area



Walk in Freezer, Little Bakery Prep area, Operational



Under counter cooler and rolling sandwich bar, operational, used for storage of back up products



Steam table and Hot Plate, Operational, During school year filled with ice for cold bar usage



Under counter cooler drawers, described on previous page



Reach in Ice Cream Freezer, Operational



Point of Sale System in Deli and Bakery, Operational



Hood Vent and wall surround, Not currently used in facility



Cold Salad bar, Service sneeze guard removed to slide under counter edge, sneeze guard installed on counter edge for customer to access and serve self, operational



Large screen Television, Operational, piece from residential life area



Vent Hood with Grill Top under and Fryer. Image show Pretzel warmer on top of Grill Top. All operational, Pretzel warmer is only piece currently used



Beverage Bar with Soda Fountain, Coffee Maker, Coffee Bean Grinder, Cappuccino Machine, all operational and used. Counter

below is service counter with drawers. Converted to fit need of counter for beverage items.



Front Reach in Beverage Coolers, Provided by Beverage Companies,



Bakery Display Cabinets, Accessible from back and front, piece from another dining unit



Smoothie counter, Freezer bar and 2 commercial blenders, operational, specified via smoothie franchise



Soft Serve Ice Cream Machine, specified via smoothie franchise, operational



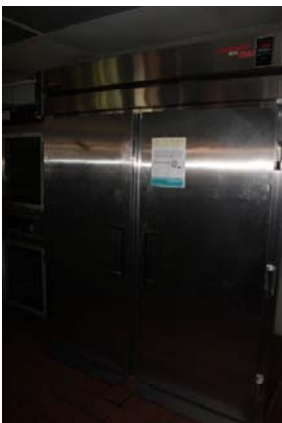
Double Deck Proofer and Oven, Bakery Prep, Operational



Counter reach in hot display cabinet, operational



Reach in Display Cooler, Operational



Reach in Coolers, Bakery Prep storage, operational



Salad Bar with Sneeze guards, extra equipment stored in rear of first floor dining area, west side





Bakery Prep, 3 mixers-two commercial grade and one non-commercial. Operational and used extensively



Copier/Printer and Employee Computer with Internet access, Overflow from Office Space



Office Space, 4 desk systems, 4 tasks chairs, 2 lateral files, 2 4-drawer file cabinets, 4 desktop computer systems

## APPENDIX C

### FINISH SAMPLE BOARD



**APPENDIX D**  
**IRB DOCUMENTS**

**Oklahoma State University Institutional Review Board**

Date: Wednesday, July 14, 2010  
IRB Application No: HE1051  
Proposal Title: Case Study of Dining Facility According to LEED

Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 7/13/2011

Principal Investigator(s):

Cheryl Dillard	Randall R. Russ
431 HES	431 HES
Stillwater, OK 74078	Stillwater, OK 74078

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, [beth.mcternan@okstate.edu](mailto:beth.mcternan@okstate.edu)).

Sincerely,



Shelia Kennison, Chair  
Institutional Review Board

To whom it may concern:

You are being asked to participate in a design charette for your place of employment. This activity will provide research material to aid a student in their master's design thesis project. Listed below are the project title, purpose, and activity that will occur. You have the option not to participate, if you do not wish to do so. However, should you chose to participate your manager will notify you of the day and time Cheryl Dillard will be conducting the design charette. Thank you for your time and assistance. Should you have any further questions please contact Cheryl Dillard at cheryl.dillard@okstate.edu (806-470-7808) or Dr. Randall Russ at randall.russ@okstate.edu (405-744-9524).

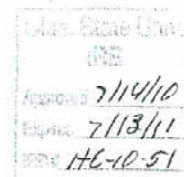
Project Title:

Case Study of a renovation of a satellite college foodservice concept according to the United States Green Building Council's LEED rating system."

Describe the purpose and the research problem in the proposed study.

To attain insight from the users of the space as to their opinion of the design of the space. The research problem is to renovate a satellite dining facility of the university dining services department at Oklahoma State University according to the LEED program. The LEED program is a third party verification program from the United States Green Building program. LEED stands for Leadership in Energy and Environmental Design. LEED provides third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Research activity: One day in June or early July arrange a time to come and conduct design charette with employees of SPW dining facility. Employees will randomly be arranged in groups, given a floor plan and markers, and asked to draw ideas of changes to the space. Upon completion of the exercise the groups will present their ideas to the group as a whole. Floor plans will be collected by Cheryl Dillard.



## PARTICIPANT INFORMATION SHEET

You are asked to be a participant in the research project titled "Case Study of a renovation of a satellite college foodservice concept according to the United States Green Building Council's LEED rating system." Cheryl Dillard at Oklahoma State University is conducting this study and has a responsibility to obtain informed consent. The purpose of this study is to explore the opinions of the employees in the foodservice environment as to the design decisions for the renovation proposal.

You understand that you must be at least 18 years of age and are asked to participate in a design charette. As part of the charette, all participants will be randomly grouped; your group will be given a blank floor plan for the Scott Parker Wentz cafeteria to draw your ideas on for renovation of the space. Then your group will present your ideas to the group as a whole.

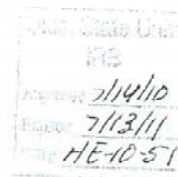
You understand your participation is totally voluntary and you may stop participation at anytime if you feel uncomfortable. There are no known risks associated with this project which are greater than those ordinarily encountered in daily life. The results of the study will provide information for the design components of the space.

The research records will be stored securely in a locked filing cabinet and only researchers and individuals responsible for research oversight will have access to the records. The records will be destroyed one year after this study is completed. Any written results will discuss group findings and will not include information that will identify you. The final report of this project will be disseminated through a master's thesis. It is possible that the consent process and data collection will be observed by research oversight staff responsible for safeguarding the rights and wellbeing of people who participate in research.

You have been given the right to ask and have answered any questions concerning the study. You understand that you may contact Cheryl Dillard ([cheryl.dillard@okstate.edu](mailto:cheryl.dillard@okstate.edu), Tel: 806-470-7808) or Dr. Randall Russ ([russ.randall@okstate.edu](mailto:russ.randall@okstate.edu), Tel: 405-744-9524) with any questions.

By participating in the charette I am consenting to participate.

*If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-3377, [irb@okstate.edu](mailto:irb@okstate.edu).*



VITA

Cheryl Marie Dillard

Candidate for the Degree of

Master of Science

Thesis: CASE STUDY OF A RENOVATION OF A SATELLITE COLLEGE  
FOODSERVICE CONCEPT ACCORDING TO THE UNITED STATES  
GREEN BUILDING COUNCIL'S LEED RATING SYSTEM

Major Field: Interior Design

Biographical:

Education:

Completed the requirements for the Master of Science in Interior Design at  
Oklahoma State University, Stillwater, Oklahoma in July, 2010.

Completed the requirements for the Bachelor of Science in Interior Design at  
Oklahoma State University, Stillwater, Oklahoma in 2010.

Completed the requirements for the Bachelor of Science in Dietetics at Kansas  
State University, Manhattan, Kansas in 2003.

Experience:

2003-2004, Foodservice Manager, University of Notre Dame, South Bend,  
Indiana

2004-2008, Foodservice Assistant Manager, Oklahoma State University,  
Stillwater, Oklahoma

2008-2009, Interior Design Assistant, Parkhill, Smith, and Cooper, Lubbock,  
Texas

2009-Present, Interior Design Assistant, Oklahoma State University A&E  
Services, Stillwater, Oklahoma

Professional Memberships:

National Association of College and University Foodservices 2003-2008.

Name: Cheryl M. Dillard

Date of Degree: July 2010

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: CASE STUDY OF A RENOVATION OF A SATELLITE COLLEGE  
FOODSERVICE CONCEPT ACCORDING TO THE UNITED STATES  
GREEN BUILDING COUNCIL'S LEED RATING SYSTEM

Pages in Study: 61

Candidate for the Degree of Master of Sciences

Major Field: Interior Design

Scope and Method of Study:

The scope of the case study was to achieve LEED certified status through utilization of the design process for interior design. Programming, Analysis of LEED Credits, Schematic design, and Design development were methods of study utilized to accomplish the case study of renovating a satellite foodservice concept according to the United States Green Building Council's LEED rating system.

Findings and Conclusions:

Findings for the study include the outline of the LEED points that were specific to the project and could be easily attained. Each point is outlined and a brief description of the process for accomplishment is enclosed within the section. Upon the conclusion of the case study the LEED analysis resulted in a potential for a LEED silver status project. Design evaluation simultaneously included components to meet client needs for a successful design.

ADVISER'S APPROVAL: Dr. Randall Russ

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