



Executive Summary

The Center for Health Research and Rural Advocacy poses many interesting aspects relevant to research analysis. Some of the more interesting features include recycling costs for LEED credits, an expansive aluminum curtain wall system for prefabrication, as well as difficult site logistics.

When analyzing recycling costs, effort must be put forth to garner information from industry professionals. This information will be gathered using interviews and surveys from fifteen professionals including architects, construction managers, LEED experts, and even owners representatives. The surveys will be used to compile industry trends in terms of who is determining that recycling should be pursued on a project. LEED cost breakdowns will be created to quantitatively assess pursuing recycling credits on construction projects.

The technical analysis for the Center for Health Research will include determining the feasibility of prefabrication of components for the aluminum curtain wall. Cost and schedule analyses will be done to determine if the project would benefit from a prefabricated system. Quality control issues and concerns will also be raised through industry surveys and interviews.

The final area for study will include the site logistics of the CHRRA. The site is extremely condensed due to the close proximity of the Weis Research Center and Centre Street. Having only one main entrance and exit may cause additional project constraints during key construction activities such as superstructure delivery and erection as well as precast panel delivery. 3D and 4D CAD models will be developed to determine if the site logistics are adequately planned for these construction phases.



Critical Issues Research Method

Problem:

- Recycling is a large part of the initial LEED certification credit breakdown for the Center for Health Research and Rural Advocacy. These credits sound easy to garner, but require numerous hours of project management, adequate space for recycling bins, as well as additional cost for the recycling itself. Recycling costs in Danville, Pennsylvania are not competitive when compared with larger building markets such as Washington, D.C. Since the CHRRA is pursuing a basic LEED sustainability credit, can these premium dollars be spent on elsewhere instead of recycling?

Goals:

- To accurately portray the feasible LEED credit options that could be pursued in lieu of recycling credits.
- To develop a LEED guideline which project administration can use to determine if recycling is a cost effective credit on any project.

Audience:

- Architect, Contractors, Owners, and Subcontractors can all benefit from a guideline to determine if recycling is cost-effective credit on a specific project.
- United States Green Building Council (USGBC).

Objectives:

- Develop a guideline which can be used as a tool by industry members for determining if recycling is feasible.
- Establish a clear idea of what determines the feasibility of using recycling on a project. i.e. site congestion, cost, management time, paperwork, etc.
- Identify the positives and negatives that recycling brings to a project.

*Research Methods:*

- Interview/survey fifteen industry professionals who are involved in the different level of LEED design and management. The professionals will include four contractor project managers, four architects or design professionals, four owner representatives, as well as three LEED accredited professionals.
- Compare results from the interviews/surveys according to each discipline area as well as the overall industry.
- Compile project specific breakdown in terms of four projects of size and usage similar to the CHRRA located in the Washington D.C., Maryland, Pennsylvania, and Virginia area.

Outside Information Sources:

- Dr. David R. Riley, Penn State University
- Mitch Leiby, Project Manager; Geisinger Facilities
- Bill Gladish, Director of Construction (Owners Rep); Geisinger Facilities
- Steve Gastright, Lead Architect; Ewing Cole
- Other Professionals to be determined

*Initial Draft Interview/Survey Questions:**Architect:*

1. How is it determined which LEED credits are going to be pursued on your project?
2. What are the determining factors for selecting these credits? Cost? Existing Conditions?
3. Do you often work closely with contractors in determining the LEED credits for a project? If yes, is this a beneficial exchange of information? If not, is there a reason why?
4. Do you often work closely with the owner or owner's representative in determining the LEED credits for a project?
5. Do you feel the way LEED credits are determined is favorable to the success of a project?
6. If you had the opportunity to work with other parties on the project with regard to LEED aspects would you?
7. How often is recycling used as a LEED credit on your projects?
8. Is a feasibility study for recycling typically utilized?

*Contractor:*

1. Do you have the opportunity to work with the team determining which LEED credits are pursued on your project? If not, would you like to have a say in the decision?
2. Do you feel the way LEED credits are determined is favorable to the success of a project?
3. Do you view recycling as a positive or negative aspect on a project?
4. If the contractor has recycling implemented on his/her project:
 - a. About how much time per week do you spend with recycling related issues?
 - b. How difficult was it to find adequate space for recycling bins?
 - c. Would you reconsider utilizing recycling if LEED points could be gained in other aspects?
 - d. Do you feel that recycling directly affects the project schedule and planning?
 - e. Is there another LEED credit you would rather pursue in lieu of recycling?
5. If the contractor does not have recycling as part of the LEED credit breakdown:
 - a. How would you feel if recycling became part of the LEED breakdown for your project?
 - b. How much time would you expect to spend per week on recycling issues?
 - c. Does your project have adequate space for recycling bins?
 - d. Is there a LEED credit you would rather pursue recycling in lieu of?

Owner:

1. Is utilizing recycling on your project important?
2. Does recycling help garner a positive image on your project?
3. Would you pursue different LEED credits instead of recycling if you could save money and time on your project?
4. Did you work with the LEED team in determining which credits should be explored?
5. If yes:
 - a. Was this beneficial to you?
 - b. Were there any LEED credits that were of particular interest to you?
 - c. In the future, would you be involved in this decision making process?
6. If not:
 - a. Would you have liked to have been a part of these decisions on your project?



Technical Analysis Methods

Research Analysis #1: Prefabrication of Aluminum Curtain Wall System

The first analyses to be conducted on the Center for Health Research and Rural Advocacy will take an in depth look at the expansive aluminum curtain wall system. The possibility for prefabrication of this system would allow for schedule and cost reduction, decrease site congestion, and utilize existing conditions.

In determining the feasibility of this study I will need to remain in close contact with the project manager for the curtain wall subcontractor. The general contractor has already expressed that prefabrication for this system would be beneficial from their perspective.

The following resources will be utilized or created in order to determine if prefabrication of this system is feasible:

1. Cost breakdown of labor and material for assembly and erection of curtain wall on the project site to be compared with one created for offsite assembly and on site erection.
2. Time breakdown for on site activities to be compared with estimated durations for off site production.
3. Site logistics of on site work for stick built system and prefabricated system.
4. List of quality control issues which can be avoided utilizing a prefabricated system.
5. List of prefabrication concerns raised by project participants.

Once all these resources are gathered and analyzed, an appropriate determination can be made as to if prefabrication of the curtain wall system should be explored.

Research Analysis #2: Site Congestion Analysis

The second analysis on the project will involve site congestion issues and project planning. Only one main entrance and exit is utilized on the site off of the main thoroughfare. In the future, this may cause added frustration for doctors and patients in the existing facilities which may reflect a negative image for the project.

Part of the construction process is the relocation of Centre Street so that excavation could occur. Would it have beneficial to incorporate site logistics into this relocation and utilize this



opportunity to create multiple entrances and exists to the site? Would this initial cost benefit the project in terms of flow and logistics?

The following research tools will be utilized to determine the feasibility of the analysis:

1. Cost analysis of additional infrastructure.
2. Survey of patients and doctors of existing facilities as to their concerns for traffic patterns and delays.
3. 3D/4D site plan of possible critical construction times (i.e. steel column and precast architectural panel deliveries).
4. Alternative site plans with new entrance and exists to accommodate these construction issues.

After looking at these issues and resources an educated determination of site logistics can be made to determine if additional infrastructure should be utilized.

Weight Matrix

Description	Research	Value Eng.	Const. Rev.	Sched. Red.	Total
Prefabrication	x	10%	10%	10%	30%
Site Logistics	10%	15%	x	5%	30%
Recycling	30%	5%	x	5%	40%
Total	40%	30%	10%	20%	100%