

Sustainability in construction at Creighton

Like many other higher education campuses and companies Creighton is striving to draft their own policies, procedures and guidelines. Through the support of many who have already paved the way this is the first of many versions to come of Creighton's **Think Green at the Blue**.

The foundation of sustainable facilities means the integration of design, construction, and operation methods that reduce the environmental impact of a facility over its life.

The team of architects, engineers, and contractors are a vital part in executing the University's vision of sustainability. The roles and responsibilities for the design team and contractors are as follows:

The Design Team

- Bring ideas to the process and define the trade-offs to allow decision making
- Collaborate and have an attitude of peers among all team members
- Provide direction and leadership to the University to allow them to successfully fulfill their role
- Facilitate the overall process
- Commission the facility

The Contractor

- Ultimately has to execute the plan
- The General Contractor must have business practices that promote sustainability
- Will be required to develop much of the documentation required for official certification
- The General Contractor must provide strong leadership to the entire construction team to ensure the process is followed

A major item that will assist the University to design and build “green” is to have a LEED Accredited Professional on both their design and construction team to guide their efforts. The University will be working to achieve sustainability using the LEED guidelines on renovations and remodels but not necessarily seeking certification. When possible on new construction the University would seek Silver LEED Certification. This is when the team would need to be sure that the prerequisites can be met depending on the scope of work.

There are five sections addressed in the LEED Certification process; Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and the final section addressing Indoor Environmental Quality. Each of the sections listed has at least one prerequisite that must be met to achieve any points or credits from that section. These sections and prerequisites are covered in-depth in the [New Construction & Major Renovation Version 2.2 Reference Guide](#) created by the U.S. Green Building Council (LEED).

Jason Cerone, LEED AP, working for Dicon Corporation was kind enough to take the list that was sent out by Creighton to show how those ideas could or could not be used in the LEED process.

- Recycle card board and otherwise reduce the amount of trash sent to the waste stream.
 - Prerequisite one in the Materials and Resources section requires that you provide an easily accessible area that serves the entire building and is dedicated to the collection and storage of materials for recycling, including at a minimum paper, corrugated cardboard, glass, plastics and metals.
 - In order to earn any points/credits you will need to divert at least 50% of construction waste from disposal.



- Use products made of rapidly renewable materials like bamboo.
 - To earn points/credits for the Rapidly Renewable Materials you must use rapidly renewable materials for 2.5% of the total value of all building materials and products used in the project based on cost.
 - It is very important to run calculations early in the process when trying to use rapidly renewable materials as the costs to do so is very high in some cases and may not be feasible.
- Use materials that are produced locally or regionally.
 - To comply with LEED building materials must be extracted, harvested or recovered as well as manufactured within 500 miles of the project for a minimum of 10% of the total materials value.
 - Mechanical, electrical and plumbing items along with specialty items such as elevators and equipment cannot be included in this percentage.
 - It is very important to run calculations early in the process when trying to use materials that are produced locally or regionally as the costs to do so are very high in some cases and may not be feasible.
- Turn off engines when the machine isn't being utilized.
 - I do not believe that this would qualify for a LEED point/credit as there is no way to truly monitor an activity like this.
- Car pool to the job site.
 - This may be a way to earn an innovation point/credit but projects need to provide parking spaces for people who car pool to work or school after construction is complete to earn points/credits.
- Commission HVAC controls in remodel projects.
 - You are required by Prerequisite one in the Energy and Atmosphere section to Commission all projects. You can earn extra points/credits for Enhanced Commissioning which is much more in-depth.
- Use "green" chemicals for final cleaning.
 - They have an entire section devoted to chemicals used in construction so I believe that this item would not be up to par for what is required.
- Provide document of affidavit...
 - This would be a legal item.
- Demonstrate water conservation like using little water when washing down/cleaning a site.
 - This is another area where I believe the item listed would not be up to par as they require you to show that you will reduce water usage by 50-100% for landscaping and require that you reduce that amount of water used in building baseline by 20-30% for items such as water closets, urinals, lavatory faucets, showers and kitchen sinks.
- Recycle carpet, ceiling tile and other products removed as part of demolition.
 - This is the same as required for diverting construction waste from the landfill.
 - You can earn points for reusing 5-10% of materials based on cost for the project on the project you are remodeling or demolishing for a new building.
 - You can also earn points/credits for Building reuse if 75-95% of an existing building is reused. It is acceptable to put an addition on an existing building and still earn this credit as long as the addition is not more than two times the square footage of the existing building.

Summary

The really great thing that came out of the list and the evaluation is we learned that some ideas are good and others can help in pursuit of LEED. But most of all we need to keep thinking and generating ideas to explore new ways of doing business.

Resource efficiency the 3R's - Reduce, Recycle, Reuse

There was a theme that went through the responses from the architect, engineering and contractor world when the plea for help went out. The theme was one of resource efficiency and waste reduction during the construction process.

Recycling Construction Waste

- Virtually all materials generated on a construction site can be recycled, subject to local opportunities. Wastes must be kept clean and separated to ensure opportunities for reuse or recycling
- Cardboard packaging can be broken down and recycled
- Top soil can be saved and reused on site for landscaping or sold to nurseries
- Metals can be recycled
- Carpeting can be recycled
- Paper from trailers and offices can be easily recycled into a fine paper bin
- Separate materials according to:
 1. Timber
 2. Metals
 3. Masonry
 4. Plastics
 5. Plaster
- Train workers prior to the job about waste minimization goals
- Centralize cutting operations to reduce waste and simplify the sorting process
- Set up clearly marked bins or trash cans for different types of usable waste: i.e. wood for wood chips in flower beds, sawdust for compost, etc.
- Deliver FF&E or other salvage material that was part of demolition to organizations like Habitat for Humanity
- Contractors working with the University on smaller projects will coordinate recycling with Facilities Management.



Choose a strategy for each stage of construction in your Waste Management Plan:

Land Clearing

- Minimize disruption to existing vegetation and soils
- Limit the use of heavy machinery which damage soils and vegetation
- Excavated soils and trees can be used for final landscaping

Excavation

- Limit the amount of excavation need to limit the soil disturbance
- Excavated materials can be used as backfill or landscaping

Foundation work

- Utilize reusable forms

Framing

- Design using standard sizes to reduce cutting waste
- Use prefabricated wall, roof, and floor systems
- Send waste wood to recycling facility to make chips for pulp, composite wood products, etc.

Insulation

- Use prefabricated wall systems with insulation already included
- Use blown in cellulose in walls
- Use scrap insulation for sound proofing interior walls

Drywall

- Design using standard sizes
- Send scrap materials to a recycling depot

Paint

- Use leftover paint as undercoating at next job
- Send excess paints and solvents to a recycling plant

Exterior finishing

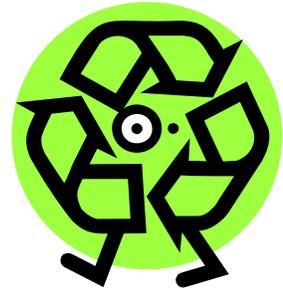
- Measure twice-cut once to minimize waste
- Store materials carefully to avoid damage
- Salvage bricks and blocks from demolition projects
- Broken bricks and blocks can be used as backfill in some situations
- Send vinyl and aluminum siding to recycling facilities

Roofing

- Send asphalt shingles to a local recycling facility

Early Creighton Decisions

- All materials that can be manufactured with an Energy Star rating are required over non-rated products
- Green Cleaning will be the exclusive method of cleaning at the University on August 1, 2008.
 - Replacement of traditional cleaning agents with environmentally friendly alternative.
 - Equipment that is more efficient, quieter, and more effective in removing contaminants from the indoor environment
 - Processes that minimize the use of water and energy, and promote healthy indoor air quality, all while providing a high level of cleanliness
- Interior and exterior paint products have change to a Low VOC/Green products from Sherwin Williams.
 - Interior Products
 - Primers – ProGreen 200 Latex and Harmony Latex
 - Finish Coats – ProGreen 200 flat, eggshell, and semi-gloss
Harmony flat, eggshell, and semi-gloss
Duration Home matte, satin, and semi-gloss
Proclassic Waterborne satin, semi-gloss, gloss, and high gloss
 - Specialty Coatings – Pro-Cryl Universal primer for metal
O VOC Acrylic
Industrial Enamel 100 - oil based industrial enamel less than 100 g/l VOC
Pro Industrial High Performance Epoxy
Pre-Catalyzed Waterbased Epoxy
Porch and Floor Enamel



- Exterior Products
 - Resilience Exterior flat and satin
 - Superpaint Exterior flat, satin, floss, and high gloss
 - A-100 Exterior flat, satin and gloss

Summary

We are at the very beginning of our program and will look forward to working with the professional and educational community to assist us as we grow into a University who is proud of its sustainable habits. You can look forward to changes in our design guide to reflect these new practices. It will charge us to re-evaluate our standard products and specification to bring them into the "GREEN".

Special Thanks To

***Doug Alvine – Alvine Engineering
Jason Beiter – Kiewit Building Group
John Farson and Jason Cerone – Dicon Corporation
David Langenberg – Hawkins Construction
Dave Goett – Muth Electric
Creighton community
University of Florida***

for sharing their wealth of information on this topic.

