DOE'S First LEED-Rated Building

Central Supply Facility

Argonne National Laboratory

Sustainable Design for ANL-E Projects

Program History

<u>Summer 1998</u>
ANL becomes 'Accelerated Demonstration Site' and receives training on DOE Roadmap

<u>Spring 1999</u>
Gap analysis is completed comparing ANL operations to DOE guidance

<u>Fall 2000</u>
Implementation Plan is written integrating sustainable design into ANL-E projects.

<u>Winter 2001</u>
Training and initial implementation of Plan.

<u>Fall 2002</u>
Numerous successes, including LEED Silver rating.

Sustainable Design for ANL-E Projects

CSF Features

- Fly ash aggregate in concrete
- Recycled concrete block
- Pulverizing and reuse of existing gravel asphalt & sub-base
- Reuse of existing excavated soil
- Recycled concrete curbs
- Native trees and grass seed
- Roof drainage into existing wetland
- High performance windows selective to West and North
- Clerestory windows
- Recycled structural steel
- Recycled sustainable lumber
- Natural linoleum floor
- Recycled content carpeting
- White roof
- Low VOC and lead free paints
- Recycled content ceiling tiles
- Gypsum Board with recycled content

Sustainable Design for ANL-E Projects

CSF LEED Checklist

Yes	No			
9	**1**	**Sustainable Sites**		**14** Total Possible Points
1		Credit 1	**Site Selection**	1
1		Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
1		Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
1		Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
1		Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
1		Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
1		Credit 6.1	**Stormwater Management**, Rate or Quantity	1
1		Credit 6.2	**Stormwater Management**, Treatment	1
1		Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands, Roof**	1
	1	Credit 8	**Light Pollution Reduction**	1
4	**1**	**Water Efficiency**		**5** Total Possible Points
1		Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
1		Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	1	Credit 2	**Innovative Wastewater Technologies**	1
1		Credit 3.1	**Water Use Reduction**, 20% Reduction	1
1		Credit 3.2	**Water Use Reduction**, 30% Reduction	1

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CSF LEED (con't)

Yes	No			
6		**Energy & Atmosphere**		**17** Total Possible Points
2		Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
2		Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
1		Credit 3	**Additional Commissioning**	1
1		Credit 5	**Measurement & Verification**	1

Yes	No			
5	**2**	**Materials & Resources**		**13** Total Possible Points
1		Credit 2.1	**Construction Waste Management**, Divert 50%	1
1		Credit 2.2	**Construction Waste Management**, Divert 75%	1
	1	Credit 3.1	**Resource Reuse**, Specify 5%	1
	1	Credit 3.2	**Resource Reuse**, Specify 10%	1
1		Credit 4.1	**Recycled Content**, Specify 25%	1
1		Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
1		Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1

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CSF LEED (con't)

Yes	No			
7	**3**	**Indoor Environmental Quality**		**15** Total Possible Points
	1	Credit 2	**Increase Ventilation Effectiveness**	1
1		Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1		Credit 4.2	**Low-Emitting Materials**, Paints	1
1		Credit 4.3	**Low-Emitting Materials**, Carpet	1
1		Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1		Credit 6.1	**Controllability of Systems**, Perimeter	1
	1	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
	1	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
1		Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
1		Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1
5	**1**	**Innovation & Design Process**		**5** Total Possible Points
1		Credit 1.1	**Innovation in Design**: Building Downsizing	1
	1	Credit 1.2	**Innovation in Design**: Building Removal	1
1		Credit 1.3	**Innovation in Design**: Ergonomic Conveyer System	1
2		Credit 1.4	**Innovation in Design**: Exemplary Performance, Local Materials	1
1		Credit 2	**LEED™ Accredited Professional**	1
36	**8**	**Project Totals**		**69** Total Possible Points

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Sustainable Design for ANL-E Projects

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Central Supply Facility LEED Associated costs

• Consultants and commissioning	$75,000
• A/E effort additional options	$10,000
• Construction	$45,000
• LEED application effort	$38,000
Total	$168,000
	2.85% of TEC

Sustainable Design for ANL-E Projects

Lessons Learned from the PM

- Future projects can achieve a higher rating at lower cost
- Utilize the LEED “gimmees” that apply to any ANL project
- USGBC comments on the CSF will help inform future projects
- Initiate all LEED pre-requisites during Title I design
- Review and document throughout the process rather than at the end

Sustainable Design for ANL-E Projects

Next Steps

- Seeking LEED certification for Center for Nanoscale Materials (CNM) – projected to receive 38 points and reduce energy use by 25%

- Incorporating results from LEED projects into smaller ongoing modifications, remodels