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ENVS 664 – Sustainable Design

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Project: Green Buildings & Rating Systems: The Audubon Center at Debs Park

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Audubon Center at Debs Park, Los Angeles, CA
-Year Completed: 2003
-Size/Type: 5,020 Sq.Ft, Interpretive/Educational Center for Non-Profit Organization
-Total Project Cost: $5,500,000 ($2.5 million for building, $3 million for site work/landscaping)
-LEED Rating: 53 points (Platinum)[1]

For this project I will consider a newly constructed building – The Audubon Center at Debs Park, Los Angeles, CA – and analyze its rating under the LEED system. This building is rather interesting because it represents an extreme in the rating system: it was the first building in the U.S. to achieve a Platinum rating under version 2 of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Rating System.[2]

The Rating System

The LEED rating system is developed and implemented by volunteer committees of industry experts and practitioners. This rating system has established a standardized benchmark against which to measure a building's sustainability, and has created a sought-after pedigree which has brought excitement and competition to the emerging field of sustainable design.

[1] USGBC, LEED Projects Directory, Overview http://leedcasestudies.usgbc.org/overview.cfm?ProjectID=234
[2] USGBC, LEED Projects Directory, http://leedcasestudies.usgbc.org/overview.cfm?ProjectID=234

LEED's panel of judges measure a building against 69 individual categories of sustainability, and assign a score based on its adherence, out of a possible perfect score of 69:

The LEED Rating System for New Construction: [3]

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

The downside of standardization, of course, is that individual projects may be overly favored or penalized due to arbitrary factors that make any of the 69 categories more or less attainable to its unique stituation. Another caveat of LEED rating is that it costs significant money to apply for a rating. And it should be mentioned that there are other rating systems which are equally stringent measures of sustainability. That being said, any building which goes through the comprehensive process of a LEED rating, and receives a score of 26 or higher, can be admired for its commitment to, and successful execution of, sustainability.

Debs Park's LEED Platinum Rating: A Perfect Storm of Good Intentions and Good Luck

How did the Audubon Center at Debs Park manage to get not just a LEED rating, but the highest score ever awarded? It was a "perfect storm" of positive factors: the builder's commitment to sustainability, a fortuitous injection of money to cover the extra costs associated with some of the specialized materials, construction, and technology, and unique site needs that justified many of the 69 LEED rating categories. The commissioner of the building, the National Audubon Society, decided to pursue a "green design" before even selecting a site or architect, as part of its environmental mission. The decision to push it up to Platinum came with the selection of a project team, and the well-timed receipt of a large donation earmarked by the donor to help the project meet Platinum. And the building's site, in an unbuilt but degraded hilly area off the city's power and sewer lines, helped round out the decision:

> "The clincher in the decision came along with the cost estimates for connecting to city utilities. Since the Center is located more than a quarter-mile from the nearest electricity and sewer lines, on-site wastewater

[3] LEED for New Construction, FAQ - http://www.usgbc.org/ShowFile.aspx?DocumentID=3352

> treatment and electricity generation would cost only a slight premium. And, they would lend themselves to a high LEED rating. The team decided to go for Platinum in December 2001."[4]

Ground was broken, and the building was completed and awarded the sought-after Platinum status in 2003. This was achieved before the current wave of "green buildings" had gone up around the country – Debs Park was a trendsetter, and many of the technologies it used were relatively untested and experimental, putting its implementation on the steepest edge of the learning curve.

Zero Energy Building

The most striking feature of the Debs Park building is that it's "off the grid" – a zero-energy building which uses minimal fossil fuel, instead producing all of its own electricity from solar technology. Additional energy efficiency comes from thermal insulation and a building design that captures maximum daylight into interior spaces, reducing lighting needs. The roofs at Debs Park are covered with solar collectors of two types, to take advantage of the blistering California sunshine. Regular photovoltaic cells provide electricity for lighting, plug-in appliances, and water pumps, and a stack of batteries stores up to 5 days' worth of power for cloudy spells in the winter (a portable generator can be sent up to the Center via pickup truck on rare winter occasions when the sky is clouded for more than 5 days).

Cold Air From Hot Water

Even more unusual is the solar air-conditioning technology, termed "solar thermal," which derives its power not from photovoltaic cells, but from solar-heated water. Rather than using a compression engine like regular air conditioners to induce the cooling action of evaporation/condensation, solar thermal uses water heated by the sun to a temperature of 190 degrees, plus a small amount of energy from the photovoltaic cells to pump the hot water through the system. It's a model of efficiency: at the peak heat of the day, when it's needed the most, the solar-heated water is at its hottest and most able to power the cooling system. "Peak-load demand is the critical part of assuring reliable energy supply, and air conditioning is the critical part of peak demand," states Les Hamasaki, distributor of the building's solar collecting

[4] USGBC, LEED Projects Directory, http://leedcasestudies.usgbc.org/overview.cfm?ProjectID=234

devices. Keeping this load off the city's electrical grid helped boost the Debs Park Center to Platinum.[5]

Water Usage, Landscaping, Materials, Siting

In addition to energy efficiency, Debs Park Center worked hard to earn its 53 LEED points. To name just a few: it treats 100% of its own wastewater with a system built under the parking lot, reducing the burden on the city's sewage system. Its native plantings require no irrigation whatsoever (and they attract wildlife). Construction materials were sourced from innovative recycling programs, including steel rebar that was created from melted-down guns collected by the LAPD and old cars. The siting was chosen to maximize solar collection, cross ventilation, and natural lighting. The list of 53 sustainable practices goes on.

The Visit Test

What's it like to visit the Audubon Center at Debs Park – how does this LEED rating affect the usability factor and general human experience? Having paid a visit, I was struck by the simplicity and human scale of the building. It does not look like the grand, futuristic glass-and-steel structures that have been getting a lot of press as green buildings. Rather, it's a one-story, comfortable-feeling structure which inspires no awe, but fits very well into its sunny hillside setting with a Spanish-styled open courtyard design. It fits its purpose wonderfully: serving as a destination for thousands of local schoolchildren to learn about nature in (well-ventilated) classrooms and on the center's 17 undeveloped acres of rolling hills. The building certainly doesn't hit you over the head with its green-ness – rather, it's one of those well-scaled buildings which instills a sense of comfort.

Visiting on a scorching 95 degree day during the baking California fall, it was a pleasure to walk into the building's cool, breezy central walkway, shaded by a trellis of native grape vines. The building was aligned with an open North-facing corridor between the two main indoor spaces, which acts a natural breezeway. Upon entering the building, it was even cooler – and the air conditioner wasn't on. Every room has a high, peaked ceiling with open windows

[5] Wright, Gregory: Solar-Thermal HVAC Technology Debuts in Los Angeles at new Audubon Urban Nature Center, *Heating, Ventilation, Air Conditioning & Refrigeration News (www.HVACRNews.com), December 2003*

towards the top, which let out the hot air; the concrete walls and floors further help keep the heat at bay, and rooms are equipped with energy efficient ceiling fans. The omnipresent breeze was delightful. On hot summer days when the breeze is not enough, the unique solar thermal air conditioner turns on.

53 is a good rating – but why not 69?

Taking a look at the Debs Park Center's Final LEED and Credit Summary, with the 69 categories and their final "yes" or "no" score, it appears (to my untrained eye) that a perfect score of 69 would be near impossible. For example, while the building's site was a former dusty road used by off-road motorcycles, and a gathering spot for crime and littering, it was not officially considered a "brownfield redevelopment" by LEED, so that point was lost. And being "off the grid" counterintuitively resulted in the loss of more points, including one which mandates the purchase of "green power" (not applicable for a building which buys zero power). I noticed a thinly veiled gripe on the report, in the category of "Stormwater Management: Rate and/or Quality;" the summary reads, "The required rate was achieved, but the LEED certification reviewers insisted on quantity reduction also." It's hard to miss that tone of exasperation.

It should be noted that the Audubon Center at Debs Parks also exhibits benefits that are not contained in the LEED rating system. Unlike many corporate funded LEED buildings, this project is not just for the urban elite: it was built for the benefit of the socioeconomically diverse, primarily Latino community which surrounds it.

Is the Building Living Up to Expectations?

I spoke with Jeff Champman, the master teacher/naturalist currently in charge of the center, and asked him what it was like to work in the building. He indicated that it was a great place to work, and served its purpose very well. But it's not immune to minor construction problems. "They ended up using 39 sub-contractors," he explained. "Nobody had ever worked on a building like this, so there was a big learning curve. Nothing like it had ever been built." He pointed out glitches, such as paving stones which were popping out, small cracks in the ceiling, and some plumbing leaks. "What this place needs is an onsite contractor, to handle any structural issues. I'm trained as a teacher and naturalist, not a contractor, but I end up having to

try my best to fix some of these things." All buildings require maintenance, but the new infrastructure of sustainable buildings presents an ongoing challenge for contractors unaccustomed to these technologies. As with many emerging technologies, there will be a period of "winging it" until repair systems are in place.

Financially, what was the result of this project? Duygu Erten, the building's project manager at Bovis Lend Lease, calculated that the building is 5-7% more expensive than a conventional building because of its green features.[6] This strikes me as a small premium for the benefits gained by these features, plus the added aura of good publicity. Additional costs will be incurred by construction repairs associated with these green features, but this will be mitigated and probably eclipsed by the huge savings on electricity.

It took an aggressive project like the Debs Park Audubon Center to clear a major symbolic hurdle: the attainment of LEED Platinum status. This trendsetting project will pay dividends to the sustainable building movement, as lessons learned in the construction are passed onto newer projects. Hernando Miranda, a contractor on the Debs Park project, was quoted on the "Lessons Learned" page of the LEED website's Debs Park case study: "It took a tremendous amount of effort to keep the project on the Platinum track. It took a lot more research work into alternative design solutions and products than was originally expected." And herein lies the true value of the LEED rating system: a central, organized locus of ideas, standards, and project histories, where those who wish to create sustainable buildings can tap into the intelligence gained from past achievements.

[6] USGBC, LEED Projects Directory, http://leedcasestudies.usgbc.org/overview.cfm?ProjectID=234