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Sustainaible Design
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Green Building Paper

Perkins+Will is a prominent architecture firm with 22 offices spread across the globe. The firm designed the LEED Platinum building for the U.S. Green Building Council's (USGBC) headquarters in Washington D.C. Currently, they employ the most LEED AP certified architects of any firm in the world.[1] However, before they were selected to design the USGBC headquarters the firm struggled to break into the green building design market. In an effort to both practice the ideals they espoused and demonstrate their capabilities to potential clients, Perkins+Will decided to redesign all of their offices to LEED Platinum standards. Their first project was the Seattle, Washington office, home of the firm's director of sustainable design, Amanda Sturgeon.[2] While the LEED system has its flaws, the firm was able to significantly improve the environmental quality of their office based on LEED guidelines.

Located in downtown Seattle, Washington on the second floor of a six-story 1912 brick building, the Perkins+Will offices comprise 12,000 square feet.[3] Rather than renovating the entire building, the firm selected to use the LEED Commercial Interiors category. This presented them with many challenges: the office was connected to a building-wide HVAC system, the windows were all fixed, and there were many interior offices with no access to natural light sources.[4] The firm made the decision to focus on achieving sustainability by focusing on water usage, energy consumption and resource protection – out of which emerged a plan based on natural ventilation.[5]

The natural ventilation system required several major alterations to the space. The second floor was disconnected from the building's HVAC system and fixed windows were replaced with

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[1] Perkins + Will, *Perkins + Will Seattle Office*, 2010, http://www.perkinswill.com/work/perkins%2Bwill-seattle-office.html (accessed October 16, 2010).
[2] Amanda Sturgeon, *A platinum LEED rating - how we did it*, February 22, 2007, http://www.djc.com/news/en/11186815.html (accessed October 16, 2010).
[3] *Perkins+Will Seattle Office*, 2009, http://www.thirdwavebiotech.com/PW_Seattle_Office.pdf (accessed October 16, 2010).
[4] Ibid.
[5] Ibid.

operable windows.[6] As the temperature rarely reaches levels above 78º F, it was not necessary to include any type of cooling system, but west-facing windows were treated with improved glazing to increase their reflectivity and external sunshades were installed on the outside of the building.[7] The low, eight-foot ceilings that posed a problem for a functional natural ventilation system were removed to find the original 12-foot ceilings with the original heavy timber structure.[8] To allow for air circulation, all the walls in the office were knocked down and replaced with open spaces.[9] In addition to improved air quality derived from a natural ventilation system, potted plants that remove toxins from the air were placed in strategic locations throughout the office.[10] Waterless urinals, low-flow toilets and water saving sinks replaced older, inefficient systems.[11]

Based on previous complaints that bicycle parking in the nearby parking garage was not secure and that office staff had experienced bike thefts, secure, long-term bicycle parking was installed for employees on-site as well as shower facilities.[12] Alternative forms of transportation to and from work were encouraged through $50 per month subsidies for anyone who utilized public transportation instead of driving and $60 a month subsidies as well as preferential parking spaces were given to people who carpooled.[13]

The project was completed in July 2006 with a LEED Platinum rating and a total cost of $1 million. The firm effectively managed its use of resources throughout the construction phase. All wood products came from Forest Stewardship Council Sustainable Forests and 76% of the materials

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[6] Amanda Sturgeon, *A platinum LEED rating - how we did it*,
[7] Ibid.
[8] Ibid.
[9] Ibid.
[10] Maggie Koerth-Baker, *Perkins+Will: The greening of an architecture firm*, May 19, 2007, http://www.bdcnetwork.com/article/perkinswill?page=show (accessed October 16, 2010).
[11] *Perkins+Will Seattle Office*, 2009, http://www.thirdwavebiotech.com/PW_Seattle_Office.pdf (accessed October 16, 2010).
[12] Maggie Koerth-Baker, *Perkins+Will: The greening of an architecture firm*,
[13] Ibid.

were sourced regionally,[14] a far cry from the 30% regional sourcing requirement in the LEED Platinum standards.[15] Parkins+Will also reused or recycled 98% of their construction waste.[16]

After its July 2006 completion date, the firm allowed for a six-month trial period to correct errors before starting data collection for the project's sustainability analysis. During that time frame several alterations were made. Acoustic panels were added to the conference rooms to control for increased noise levels as a result of exposing the building's original framework and open spaces.[17] Although LEED standards only require meters that track energy consumption, the firm installed water meters as well.[18] A food composting system was added to ensure tenant-based sustainable practices in line with the firm's values.[19] The lighting system required several changes to ensure its workability and the external west-facing sunshades were altered to allow for separate room control.[20] In establishing a six-month pilot period to monitor the project's success and correct flaws, Perkins+Will demonstrated an important level of insight into sustainable design. While design innovations are tested and well thought out, it is impossible to control for all externalities imposed by the natural and built environment. Recognition of possible negative effects caused by uncontrollable outside factors as well as design flaws is integral to the long-term sustainability of the office.

After the six-month pilot period, the firm began quantitatively measuring water usage and energy consumption. While a typical office uses 13.8 kilowatt hours per square foot, he project was designed to use 10.8 kilowatt hours per square foot. A year long study showed an average usage of 10.5 kilowatt hours per square foot[21] and energy usage continues to stay below the design level.[22] The project was designed for 35,000 gallons of water per year – the actual office uses 36,000 gallons

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[14] Perkins + Will, *Perkins + Will Seattle Office*, 2010,
[15] US Green Building Council, "LEED 2009 for Commercial Interiors Rating System," (Nov. 2008 (Updated July 2010)).
[16] Perkins + Will, *Perkins + Will Seattle Office*, 2010,
[17] Amanda Sturgeon, *Does your LEED building measure up?*, November 6, 2008, http://www.djc.com/news/ae/11206391.html (accessed October 16, 2010).
[18] Ibid.
[19] Ibid.
[20] Ibid.
[21] Ibid.
[22] Perkins + Will, *Perkins + Will Seattle Office*, 2010.

per year, a number well within the control level, (a typical office of this scale uses 60,000 gallons per year).[23] Additional testing showed that the office's indoor air quality was improved by 65%.[24] Through this data, it is clear that the project is achieving its stated goals and expectations.

In addition to quantitative monitoring, the firm is involved in the qualitative aspects of project success as well. Education for office, janitorial and security staff ensured proper usage of new technologies and creature comforts. Office staff was educated on the new lighting system, plant care and appropriate window operation to ensure energy efficiency.[25] The janitorial staff was educated in issues concerning water usage and cleaning waterless urinals.[26] The security officers were given information regarding the operation of the new lighting system and asked to leave all office lights off during the night – a divergence from current building policy.[27] By engaging in educational and leadership activities, Perkins+Will ensured that human actions would not interfere with, rather compliment the intent of the design. Additionally, it guaranteed the continuation of a healthy and pleasant work environment; social unrest and poor work ethics can result from problems such as unclean bathrooms and it can be avoided through the provision of knowledge.

Upon completion in 2006, the Perkins+Will Seattle Office received the BC Section Award and the IIDA Lighting Award.[28] It was the first LEED Platinum project in Washington State and continues to be among one of three today.[29] However, the firm could have improved several design concepts. Seattle is located on the Pacific Ocean and therefore has high levels of precipitation year-around. Recent innovations in rainwater harvesting systems filter captured water expanding its uses as potable water. This would have led to a significant reduction in water usage on top of the existing 40% decrease. Additionally, the controls introduced by the new windows and their treatments only provided for heat reduction. While this is important for an office with natural ventilation, Seattle has a

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[23] Amanda Sturgeon, *Does your LEED building measure up?*
[24] Ibid.
[25] Amanda Sturgeon, *A platinum LEED rating - how we did it*,
[26] Ibid.
[27] Ibid.
[28] Perkins + Will, *Perkins + Will Seattle Office*, 2010.
[29] Ibid.

long cold season. Installing technologies aimed at maximizing heat capture in the winter would allow for a year-around natural system.

The USGBC LEED system is an important innovation in creating sustainable cities. As a comprehensive, internationally recognized system it set a high standard for green building design based on informed decision-making. However, there are improvements that can be made. The unweighted point system puts equal emphasis on techniques that differ in levels of implementation difficulty, monetary requirements and environmental impact. Therefore, two buildings with the LEED Platinum rating could have markedly different levels of sustainability. Additionally, the model was created for use across America and does not account for local knowledge. While some green building techniques are universal, others apply only to specific climate zones, soils, or other local factors. The LEED system does not live a significant amount of room for variation based on lay knowledge of sustainability and therefore designs are not always as effective as they could be.

Perkins+Will architects showed superb design skills and sound judgment in creating and maintaining a green office. Despite the restrictions placed on them by LEED requirements and building layout, they were able to create a truly sustainable space that will remain so in the long term.

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