Golden Arches, Green Performance

The Campus Office Building is one of three buildings on the McDonald’s Corporation headquarters campus in Chicago’s western suburbs. Several native and adapted plant species, including this prairie grass, cover the site. The prairie grass does not require irrigation and is not regularly cut, saving maintenance costs.

McDonald’s Corporation constructed its headquarters Campus Office Building (COB) two decades ago. The building team aimed to provide an energy-efficient work setting that would instill collaboration, communication and camaraderie among employees while preserving the natural environment.

McDonald’s has identified additional opportunities to reduce energy consumption throughout the years. It decided to seek LEED certification for the COB in 2007. The COB received LEED Platinum certification in February 2009, demonstrating that existing buildings can achieve significant energy savings through ongoing sustainability efforts.

The COB is one of three buildings located on an 88 acre wooded campus in Chicago’s western suburbs. The campus also includes the Lodge and Hamburger University (HU). HU is an educational facility for restaurant operations personnel, attracting employees from all over the globe to the Home Office (HO) campus for management development and training.

Campus amenities include a full service McDonald’s restaurant in the COB and 2.5 miles of walking/hiking trails that connect with the DuPage County trail system. The Lodge contains a fitness center, pool, spa and restaurants. The facility is available to all HO employees for a modest monthly membership fee.

McDonald’s energy conservation pursuits started long before it sought LEED certification. McDonald’s USA has been an ENERGY STAR partner for more than 10 years. The U.S. Environmental Protection Agency named the company a 2007 ENERGY STAR Partner of the Year for an energy-efficiency program that resulted in a 200,000 ton decrease in CO2 emissions and energy savings of $30 million in U.S. restaurants.

The COB has received an ENERGY STAR rating of 93 and the ENERGY STAR label in 2007 and 2008. The building’s energy performance of 75.3 kBtu/ft² represents a 45% improvement over the National Average Site EUI. The operations team has reduced the COB’s annual electrical consumption by more than 16% or 1,000 MWh since January 2006.

Large windows and an open floor plan enable employees to view the natural beauty of the campus.
Passive Design Elements
Many passive design elements contribute to the energy efficiency of the building. These include building overhangs to provide shading of midday sun, natural shading from surrounding trees, open office design with no perimeter hard walled offices, skylights to maximize daylight penetration into the space, and manually operated shades on exterior windows to reduce heat load from the early morning or late afternoon sun. The windows use a combination of tinting, air gap and a low emissive coating, which minimizes heat transfer through the glass by reducing the overall U-value of the glazing.

Active Mechanical Elements
Two 500 ton two-stage centrifugal chillers and two 190 hp water tube high-efficiency boilers replaced two gas fired absorbers in 2003. The chillers at COB contain R-123 refrigerant and use a chilled-water reset control to optimize chiller efficiency. A new cooling tower was installed in 2006. The building contains 350 variable-air-volume (VAV) terminal boxes with reheat on the perimeter offices, skylights to maximize daylight penetration into the space, and manually operated shades on exterior windows to reduce heat load from the early morning or late afternoon sun. The windows use a combination of tinting, air gap and a low emissive coating, which minimizes heat transfer through the glass by reducing the overall U-value of the glazing.

McDonald’s took several precautions to maintain good indoor air quality during an interior renovation project. Low volatile organic compound paints and a forced air portable HEPA filtration unit were used in the construction area.

Lower cubicle panels allow more daylight to penetrate the space. T5 direct/indirect lights in the renovated area of the building operate at 50%.

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A limited design concept renovation improved office daylighting and views in addition to creating informal meeting areas and hoteling spaces. The building team recycled construction waste and used sustainable materials, contributing to LEED credits.

reduction initiatives. Building occupants do not have individual control over temperature settings.

**Lighting**

Building occupants can control lighting through two options. Each workstation has individual task lighting including LED lighting in the renovated areas. Building occupants also have control over after-hours lighting by dialing into the lighting control system through the desktop phones. After normal business hours, the system performs hourly sweeps and turns off.

The modified building automation system notifies the operator if the outside airflow falls below 15% of the design minimum.
any lighting that was turned on manually through the phone system. Interior lighting is primarily T8 fluorescent dual circuit fixtures. This enables the lighting to operate at 50% during McEnergy Days, a load shedding action plan. It includes lighting reductions, shutting down nonessential equipment, reduced elevator service and other mechanical, operating and occupant practices implemented on utility peak load days.

The renovated areas use T5 direct/indirect fixtures, which typically operate at 50% due to the improved daylighting and lower cubicule panels. The building also uses compact fluorescent bulbs and several pilot LED lighting installations to evaluate LED technology and identify future retrofit opportunities.

**Retrocommissioning**
A prerequisite for LEED certification under the Existing Buildings: Upgrades, Operations and Maintenance v. 2.0 rating system was retrocommissioning the building. This process helped ensure the building mechanical systems were operating as designed and intended. The retrocommissioining was completed in mid-2008 and findings were corrected throughout the remainder of 2008. Some key findings included:

- CO2 sensors in garage were outside of calibration tolerances;
- The economizer mode was difficult to activate; and
- The OA/RA damper did not actuate on one of the rooftop units.

Resolving these issues contributed to the energy reductions identified in the previous section.

**Other Green Features**

**Water Efficiency**
The site and building include several other sustainable features. Native or adaptive vegetation makes up 75% of the CO2 grounds, minimizing irrigation needs. Two lakes on the campus capture rainwater that is used to irrigate a minimal amount of maneuverable turf and flowerbeds. Low flush rate interior plumbing fixtures with automatic valves and automatic sensor faucets further reduce consumption of potable water within the building. Several submeters monitor gas and water consumption for process and other non-occupant related loads such as the quality labs, test kitchens and restaurant, and for the fire sprinkler equipment. In addition, hose bib meters track incidental water use on the building’s water spigots by grounds and housekeeping personnel.

**Parking**
More than 93% of the parking capacity at the COB is indoors at ground level and two below-grade levels, which drastically reduces the urban heat island effect associated with exterior asphalt parking lots. Dedicated preferred parking for alternative fuel vehicles comprises 3% of the total parking capacity. In addition, bike racks and locker/shower facilities are provided to promote alternative commute methods.

**Transportation**
The I0 campus uses two shuttle buses to transport employees to and from various buildings. These shuttles are fueled with biodiesel made from recycled fry oil recovered from the on-site restaurant and test labs. The glyc erin by-product from the glycerin by-product from the biodiesel production is used as part of the LEED credits. The team members had a long list of items that they originally thought would clearly be considered an IEQ credit. In a campus environment, however, many of the policies and best practices apply to all buildings. They are not unique to the building being certified.

The team reviewed the comments from the USGBC on the denied IEQ credits and reviewed the information available on the USGBC Web site from other project submittals. The team refocused their efforts on documenting exemplary performance in areas such as sustainable purchasing to receive IEQ credits. This was a successful effort that directly impacted the certification level.

**LESSONS LEARNED**

A LEED pre-assessment review is key to project success. For McDonald’s, this effort helped the project team prioritize the buildings on the Home Office campus and provided key information regarding each building’s overall potential for each LEED credit category. This enabled the project team to begin the certification effort with a solid base of information.

**Document all building policies and procedures.** Updated documentation and ongoing performance measurements are required as part of the LEED submission. Achieving LEED certification for the COB meant documenting existing operational practices, not necessarily implementing new ones.

**Tap your building operations staff.** The knowledge of our building operations staff was critical to the success of the project. The project team initially underestimated the level of involvement required from the building operation staff. The team found creative ways to help the building management team balance their daily responsibilities with the additional effort required to obtain and document the information required for certification.

**Pursue Innovation in Upgrades, Operations and Maintenance (IUOM) credits.** The team members had a long list of items that they originally thought would clearly be considered an IUOM credit. In a campus environment, however, many of the policies and best practices apply to all buildings. They are not unique to the building being certified. The team reviewed the comments from the USGBC on the denied IUOM credits and reviewed the information available on the USGBC Web site from other project submittals. The team refocused their efforts on documenting exemplary performance in areas such as sustainable purchasing to receive IUOM credits. This was a successful effort that directly impacted the certification level.

**Engage your employees, building occupants and vendors.** The certification process is an opportunity to educate building occupants, employees and vendors about sustainability and their specific roles in the process. When undertaking a green retrofit in a large organization such as McDonald’s, the project team needs to engage these individuals; they have to see the value of specific policies and procedures, and buy into any changes. The project team should listen to feedback and ideas from the occupants and employees and address their questions and concerns.

**Seek integrated communications opportunities to tell your story in a way that positively impacts your building occupants and your brand.** Both internal and external communications vehicles are necessary. McDonald’s dedicated a section on its Web site to the LEED certification effort. When making external presentations, McDonald’s employees use the LEED certification project as a visible demonstration of the company’s environmental focus. McDonald’s previously existing sustainable practices provided support for the LEED effort. In many cases the practices were just never widely publicized to the building occupants, fully documented or validated by a third party. The company also tied the certification efforts to other corporate sustainability goals, focusing on the positive environmental impacts that were being achieved and not on the certification label alone. Information on LEED was included in the company’s Green Week product fair, along with information on renewable energy, reducing waste, reducing employees’ personal carbon footprint (such as working from home or participating in carpooling) and greening the restaurant.

The company understood that LEED certification was just one of the things that McDonald’s was doing to be a good environmental steward.
McDonald’s uses green cleaning practices in all HO buildings as a part of its commitment to maintain a clean, healthy, and productive work environment. These cleaning practices promote good indoor air quality and increased comfort, ensure cleanliness and provide a healthy environment for the employees and janitorial staff.

The majority of cleaning products meet or exceed Green Seal-37 Standard. In addition, vacuum cleaners meet the requirements of the Carpet and Rug Institute Green Label testing program and are capable of capturing 96% of particulates 0.3 microns in size and operate with a sound level less than 70 dBA.

Interior Cleaning

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Pressure gage monitors the efficiency of MERV 8 prefilters and MERV 13 primary filters on an ongoing basis. The air filters were replaced after construction was completed and prior to move in. In addition, air quality testing checked for formaldehyde, particulates, VOCs, phenylcyclohexane and carbon monoxide. These tests are repeated annually throughout the building.

The BAS monitors air volume in the main air-handling units via an airflow measuring station. The minimum air quantity is controlled and trended through the BAS and alarms the operator if the minimum airflow falls below 15% of the design minimum. A screenshot of air-handling unit-1 on page 22 illustrates this feature.

Conclusion

The COB is the first McDonald’s Corporation Home Office building to receive LEED certification and is one of three existing buildings in Illinois to achieve LEED Platinum. Even though the building was constructed more than 20 years ago, the design was well ahead of its time and demonstrates that an existing building can be occupied, operated and maintained in a sustainable manner. Employees are engaged and appreciate working in a world-class sustainable office environment.

About the Author

Dave Petersen, LEED AP is a vice president and client relationship manager with Jones Lang LaSalle.