Look What the Builder Built

BY PAUL TARRICONE

An all-LED system combined with micro-targeted controls gives a California construction company its own new space to show off

All the conditions were in place for a case of *cobbler's children syndrome*—the pesky malady which strikes professionals who are so busy serving their customers that they let their own needs suffer (i.e., the cobbler's children have no shoes). The syndrome might affect the restaurant chef who serves franks and beans at home; the barber whose kids need a trim; or—in the case of DPR Construction—the builder whose own office space cries out for repair.

Alas, the syndrome has been averted at DPR. The Newport Beach, CA, contractor has moved into spiffy new headquarters and is on the way to LEED CI Gold certification for the 16,000-sq ft space, which includes offices, a conference room, a lab room and "Innovation Room." After abandoning the idea of a natural light/task lighting system for the offices and conference room, DPR opted for all-LED lighting along with personalized controls to turn its offices into a showcase project.

There was no lighting designer, per se, on the project; Callison, Seattle, WA, was the architect. DPR's Laura Lawson and Jason King were the inhouse project managers along with DPR's electrical designer. The renovation of the ground floor in this two-story building was completed last February.

One of the company's goals was for the building to serve as a "living lab" of construction and design techniques. As for lighting's role, King notes that there were three overarching criteria: energy efficiency; price and ROI; and cutting-edge technology (i.e., controls).

As part of the corporate culture, it was important to create an open and collaborative workspace. For example, in place of private offices are workstation partitions less than 42 in. high, allowing for a clear view across the office. Glass dividers between desks provide a continuous open feeling. The company also took into account the triangular shape of the office space with windows lining all three sides. The design team first looked towards daylighting through the storefront as their primary source of lighting. However, due to a number of factors—deep exterior soffits around the perimeter of the building, heavily tinted existing exterior glazing, a first-story location in a multi-story building—complete natural lighting was not an option. Furthermore, individual task lighting was not a fit for the open-office space, so the company ultimately settled on dimmable direct/indirect LED lighting. Elsewhere in the building, LED slot lights and cove lighting are used. Decorative LED pendants help round out the design, which came in at just 0.56 watts per sq ft.

FUNCTION AND FORM

A total of 93 LED 2-ft by 2-ft Lithonia fixtures equipped with Sensor Switch controls are used in the main office space and conference room. In the office space, the fixtures are housed in floating acoustic clouds at 10 ft with the exposed deck above, and lighting in conference rooms was installed at 12 ft to take advantage of the tall storefront. In addition, LED downlights (Gotham) were installed throughout hallways, bathrooms, the stadium seating BIM (Building Information Model) lab and showers.

Other lighting is meant to inspire employees. The company's Innovation Room was built to promote brainstorming and collaboration, and houses LED slot fixtures (Mark Architectural Lighting). "It had to feel different from any other gathering space in the office," says Lawson. "The light fixtures were chosen to highlight the features of the room, which is filled with writeable surfaces, flexible furniture, a large touch screen LCD monitor, a curved wood ceiling and large center pivot doors for openness and air flow." Outside the Innovative Room is a wood ceiling with imbedded linear slashes of LED light; King calls these a "conversation starter" for visitors as they walk down the hall, because the LED points are clearly visible. Lawson adds: "People are surprised that LED technology looks like a fixture and not some crazy thing."

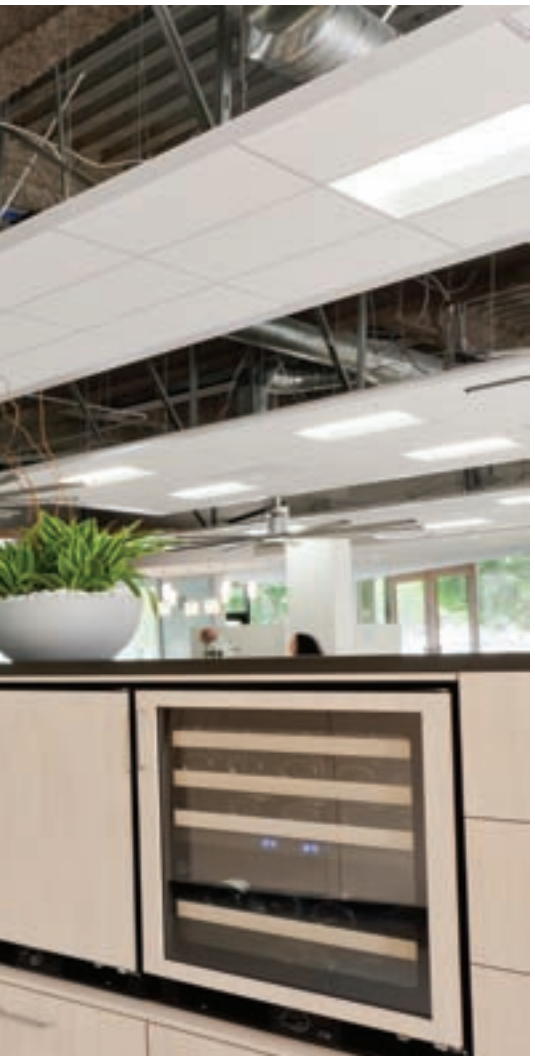
MAXIMUM CONTROL

The DPR installation is as much a story about lighting control as it is about lighting design. As required by California Title 24, all spaces

LED light slashes in the wood ceiling are an immediate "conversation starter" for visitors to the DPR offices.

are equipped with occupancy sensors. Any time a room is not occupied for 10 minutes, the lights shut off, with the exception of the bathrooms, which shut off after 30 minutes without movement. Occupancy sensors are placed every six to eight workstations, in the kitchen, conference rooms and corridors. In addition, daylighting sensors around the glazed perimeter of the open office automatically dim the intensity of the LED fixtures based on light levels from outside. "To achieve appropriate energy savings while providing comfortable lighting for the staff, we had to test our occupancy sensors to determine the right time frame until the lights shut off," says King. "After many tests ranging from 30 minutes down to 10, we chose a 10-minute period, which provided a suitable illumination time for our staff, without leaving them in the dark."

DPR took controls to the next level by personalizing lighting in some creative and unusual ways. "Not every seat is filled every day," says King. "People come and go from work site to the office. Employees have different needs—one may be looking at drawings, while the other is on the computer—so we wanted to make workstations functional and flexible for whatever task they may be completing." The solution was to give every user (more than 45 staffers) dimming capabilities at their desk through an iPhone, iPad or the task bar of a computer. The application allows users to control fixtures individually, "so instead of turning up 10 fixtures for someone to look at a drawing, they only turn up one," King adds. While all users can control their own workspaces, some are also able to control gathering and collaboration areas from their personal computers and iPhones.



One part inspiration: LED slot fixtures in the "Innovation Room" had to offer a different look than other fixtures in the building.

LED downlights were used in this auditorium, as well as hallways.

Pendant lights in the kitchen are part of the all-LED system.

The 2-ft by 2-ft luminaires used in the office also appear in the conference room, but at a height of 12 ft to take advantage of light from the storefront windows.

Currently, DPR Construction's facility operates the lighting at 30 percent, with windows that help bring in natural daylight. "Before we did any of the programming for the whole office light levels, the lights came on at 100 percent on/off, which was honestly just too much," says King. "We decided to aim low and encourage people to ask us to turn the lights up."

The illuminance levels are also tweaked based on the task. For example, the company adjusted the lights for accountants to 50 percent, as they wanted higher light levels for their tasks. Conference room levels were set at 30 percent as a default, but can be controlled by an individual's iPhone, a graphic wall switch or through pre-defined modes.

Since moving in last year, DPR has vigilantly been tracking post-occupancy energy usage through a web-based Building Dashboard display. "About 20 percent of our energy use is for lighting and we would expect to save 40 percent of the energy used by a typical fluorescent system, and that's with the LED system 'full on,' " says King. Factor in the occupancy and daylight sensors and the individual dimming from the desktop, and that baseline energy usage should be cut even further. Indeed, initial energy consumption data from the Building Dashboard shows an annual projection of only 16,500 kilowatt hours, less than half the consumption predicted in design. DPR has a nine-year lease on the space, and the ROI for the lighting is pegged at seven years. ■

METRICS THAT MATTER

DPR Construction Offices

Watts per sq ft: 0.56 (complies with California Title 24)
Energy Use: 35,600 kWh per year (designed); 16,500 kWh per year (projected actual use)
LEED Gold registered

THE DESIGNERS

Jason King and Laura Lawson of DPR Construction were inhouse project managers for the lighting/controls installation. Callison was the architect, and DNV KEMA Energy & Sustainability served as energy consultant.