The curving window wall creates an opportunity to connect indoor and outdoor environments.
Located along the Ladies Mile, a section of Sixth Avenue currently designated a historic Landmarks District, the building was constructed in 1902 as the Simpson, Crawford, Simpson department store. The massive brick structure once occupied a full city block frontage, although later renovations divided the building into two halves, in addition to adding elevators, air conditioning, and other modern services. The eighth floor penthouse, 5,500 square feet smaller than the floors below, was defined by a sweeping, 90-degree curve facing northeast, with operable windows and views of the Empire State Building. A skylight and an interior lightwell on the western perimeter gave the space even, abundant daylight.

In the years since it was built, the eighth floor had been converted from a dining room to professional office space. The most recent tenants, an engineering firm that had occupied three floors in the building, had organized the space into rows of cubicles with 5 ft high partitions. Private offices lined the curving, 80 ft...
perimeter window wall, with the result that almost no interior spaces had natural light or views to the outside. Continuous rows of fluorescent downlights were suspended from overhead, obscuring the ornate capitals and coving of the 14 ft, 6 in., ceiling.

In addition to its essential historic assets, the building was well-located on the New York City mass transit system, with four subway lines and a commuter rail station within a five-block radius. This further raised its appeal to the designer-occupants, nearly all of whom could commute to work by mass transit. The large, open floor plan would allow staff, which had previously been split between two noncontiguous floors, to work in a single open space, facilitating communication and a cohesive office culture.

**Design Intent**

The main goal of the project was to create a comfortable, functional space that would highlight the best of the building’s natural and historic elements. The new office was seen as an opportunity to showcase high-performance design strategies as well as environmentally preferable materials that were also healthy, beautiful, and affordable. Protecting air quality and taking advantage of the natural daylighting were top priorities. As the firm’s first LEED-CI project, the renovation was treated as an educational experience, an exercise in understanding the possibilities and trade-offs of this type of project.

In addition to the open studio with 70 seats, the program included two conference rooms, a small meeting room, three private offices, a kitchenette, and an IT server mezzanine. Flexibility was seen as essential, with workstations that could accommodate team reorganization and the temporary expansion or contraction of staff.

As a single-floor tenant renovation within a 100-year-old building, there were certain limitations to the scope of the project. Water supply and wastewater systems are shared and integral to the building’s core and shell. Likewise, there were few possibilities for improving the building envelope, including the penthouse roof insulation, or the central heat delivery system. However, almost every major project decision presented ways to promote excellent air quality, natural light and views, or other elements of a healthy and productive work environment.

**Lighting and Daylighting**

The extensive glazing, high ceilings, and opportunity for an open-plan office made daylight and views a primary concern. Enclosed offices along the perimeter and old workstations were removed, reopening the interiors to natural light. The dropped lighting fixtures were also removed, exposing the detail of the coffered ceiling as much as possible.

In addition to its essential historic assets, the building was well-located on the new York City mass transit system, with four subway lines and a commuter rail station within a five-block radius. This further raised its appeal to the designer-occupants, nearly all of whom could commute to work by mass transit. The large, open floor plan would allow staff, which had previously been split between two noncontiguous floors, to work in a single open space, facilitating communication and a cohesive office culture.
levels. Given the prevalence of computer-based work and the availability of supplemental lighting at each desk, ambient lighting could be maintained at relatively low levels, ranging from 20 to 25 footcandles throughout the space. Installed ambient lighting power for the main studio, representing 76% of the gross area, was 0.81 watts/square foot. The cumulative installed lighting power for the project was 1.03 watts/square foot, or 25% below the ANSI/ASHRAE/IESNA 90.1-2004 requirement.

Indoor Air Quality

To support a healthy, productive work environment, care was taken to provide superior air quality and maintain thermal comfort. An underfloor air-distribution system was briefly considered but dismissed after researching the potential cost and complications, including integration with elevator stops and stairwells. Not only was the existing rooftop air-handling unit in good condition and only seven years old, it was not feasible to simply modify the existing system for an underfloor scheme. It would have meant discarding the rooftop unit and starting over.

Working with the manufacturer, the existing rooftop unit was upgraded for improved performance and integrated with a building management system. A variable-frequency drive (VFD) was added to convert the unit from constant-volume to variable-volume operation, allowing continuous variation in fan output speed. Variable air volume (VAV) operation also allows better humidity control than with a constant-volume system. With effective dehumidification, cooling comfort can be achieved at 74°F to 75°F degrees in the summer months.

48 in., giving 97% of seated spaces a view to the outdoors.

The lighting design is a three-tiered strategy of natural, ambient, and task lighting. After removing as many interior obstructions as possible, daylighting effectiveness was improved by adding new rolling window shades to control glare on all exposures. Automated daylight controls linked to photo sensors were specified for all fixtures in the main studio, to minimize the use of artificial light during daylight hours. Fixtures on the northeast perimeter were programmed on the control system’s astronomical time clock to switch off during the day and switch on two hours before sunset. Interior fixtures respond to natural light levels by dimming. Next, taking a cue from an old postcard that showed the original Simpson, Crawford, Simpson dining room, up-light fixtures were mounted to the studio’s free-standing columns, recalling the original scheme’s column-mounted sconces. The lighting scheme intentionally highlights the detail of the ceiling while keeping the ceiling plane clear. Ambient light quality is improved by reflecting light off the white ceiling, providing diffused light to the workstations below. Metal halide sources with a warm, 3000K color temperature were selected to provide efficient, high-output light within comparatively small fixture packages. Electronic dimming ballasts were a relatively new technology for metal halide sources, and 10 of the ballasts initially failed and were replaced. These ballasts dim the ambient lighting by as much as 50%, saving on energy consumption, but do not allow low-level dimming as would be achieved when dimming incandescent sources. Despite any early complications, the resulting scheme achieves a successful resolution of historic and modern sensibilities.

The ambient lighting was designed in a zoned scheme, with seven zones in the main studio and at least three variable preset levels in the kitchenette and conference rooms. Publicly-accessible controls keypads with an “all off” button facilitate a policy of turning off lights overnight and when a zone is not in use. For sporadically occupied spaces such as restrooms, closets, and elevator vestibules, occupancy sensors were installed. Finally, each workstation was equipped with a 19 watt compact fluorescent task lamp for reading or other work requiring higher light levels.
Materials Showcase

The design team looked for interior finishes and furniture that would reinforce the goals of the project: to protect indoor air quality and showcase a range of beautiful, green materials. A palette of natural and composite materials was chosen, with many elements built in place to lend the studio a clean, well-crafted feel.

Low- and no-VOC materials were chosen wherever possible, including modular Interface carpet tiles, paints and adhesives, and office furniture. These materials were relatively easy to find locally, offered satisfactory design choices, and carried only a minor cost premium. Plywood was an exception, as it was not available as both an FSC-certified and formaldehyde-free product in the time.

Workstations were custom-milled and tailored to the geometry of the studio, but constructed simply of recycled-content MDF and FSC-certified finished plywood. Bamboo shelves, cabinets, and tabletops provide a contrasting texture. Of the natural, rapidly renewable, and recycled materials that were used—which included insulation, gypsum wallboard, framing lumber, countertops, bulletin boards, and kitchen flooring—two were especially successful discoveries: Paperstone, a 100% post-consumer recycled content countertop; and Timberstrand, a visually interesting and formaldehyde-free engineered lumber, used to frame sliding glass doors.

Water Savings

Water conservation, often overlooked in older buildings, was achieved by retrofitting existing fixtures with low-flow and sensor-operated devices. Dual-flush flush valves were installed on toilets in the ladies’ room, while the men’s room was equipped with two waterless urinals. Sensor-operated faucets using less than 0.18 gallons per cycle were installed in both restrooms. Overall, the project achieved a 44.6% reduction over LEED baseline water consumption.

In some cases, the project team encountered tradeoffs between environmental goals. Water use was one example: in place of disposable food-service items, reusable plates, cups, silverware, and other utensils are used at the office on a daily basis. To support this practice, two ENERGY STAR dishwashers were installed, which consume additional water but reduce solid waste.

Green Roof

Because of the penthouse’s unusual floor plan, a terrace of approximately 5,500 square feet was a prominent feature of the office, visible from...
Because of a raised terrace, the green roof is just below eye-level when viewed from the workstations.

Green Construction

We learned the importance of researching local availability of green products, for example the extended shipping time required to find FSC-certified wood in our market. Our general contractor had never been part of a project with sustainability goals and was initially reluctant to spend the time and extra effort to procure green building materials, such as recycled-content gypsum board, FSC-certified wood products, and recycled denim insulation. However, after completing this project, he now recommends green building materials as an added-value service to clients on other projects.

Controls

Daylight dimming and switching controls required greater than anticipated testing and adjustment. The dimmable ballasts, for example, did not initially work well with the chosen fixtures. Daylight dimming controls have proven to be most effective on the perimeter of the space, where fixtures are controlled by a timer. The lighting controls touchpad, located by the front entry, allows easy manual control and is highly effective in ensuring lights are not left on overnight.

Acoustics

An unintended benefit of the renovation is the positive acoustic qualities of the studio. Most likely, this is the result of high ceilings, the decision to keep existing large-diameter air ducts, and the use of sound-absorbing materials including carpet and cork-lined workstation partitions. A small mezzanine was built in order to isolate and control the temperature of mission-critical IT equipment, with the side benefit that no workstations are exposed to the heat and noise of the servers.

Plumbing

The age of the building’s plumbing contributed to an unsuccessful first installation of waterless urinals. After determining that odor problems were exacerbated by poorly routed drain lines, the waterless urinals were replaced with fixtures with a better-designed U-bend to trap odors. Aging plumbing has also led to frequent clogging of the office’s in-line water cooler, which was installed to eliminate bottled water. The filter is now changed approximately every two months.

Existing Buildings

Besides possessing an inherent architectural value, historic buildings can make excellent modern workplaces. Daylighting and natural ventilation, strategies that were once standard practice, are again being appreciated for their role in high performance buildings. The major interventions of the project served the dual purpose of improving the quality of the workplace and revisiting central features of workplace and revisiting central features of existing large-diameter air ducts, and the use of sound-absorbing materials including carpet and cork-lined workstation partitions. A small mezzanine was built in order to isolate and control the temperature of mission-critical IT equipment, with the side benefit that no workstations are exposed to the heat and noise of the servers.

LE S S O N S L E A R N E D

Green Roof

The choice of a modular green roof system proved to be a fortunate one. After almost two years of growth, unplanned repairs by the building owner required us to remove the green roof so that demolition and reconstruction could take place. The roof was temporarily relocated above the eighth floor in June 2008, and replaced in October.

Because of a raised terrace, the green roof is just below eye-level when viewed from the workstations.

Green Roof

The choice of a modular green roof system proved to be a fortunate one. After almost two years of growth, unplanned repairs by the building owner required us to remove the green roof so that demolition and reconstruction could take place. The roof was temporarily relocated above the eighth floor in June 2008, and replaced in October.

The green roof offers a living illustration of issues including habitat creation, stormwater runoff, and the urban heat island effect.
seasonably variable landscape that attracts insects, birds, and the attention of all visitors.

After occupying the space for more than two years, the green roof is unquestionably the defining feature of the Cook+Fox office. The firm gives monthly tours, during which the roof serves as a platform for educating visitors about issues such as combined-sewer overflows and the urban heat island effect, and design concepts like biophilia.

Interestingly, the green roof installation accounts for no LEED points, due to its size, and offered no monetary payback. According to principal Rick Cook, however, “the green roof has had a hard-to-quantify but very real impact on the firm—we would do it again in a heartbeat.”

As a laboratory for continuous education, the office renovation has yielded many lessons for future projects of all scales. The commitment to build to LEED Platinum requirements—whether designing lighting and mechanical systems or specifying materials and construction methods—required extra research, communication with subcontractors, and perseverance throughout design and construction. The fact that the designers were also the future occupants of the space went a long way in making the additional time and effort worthwhile.

Alice Hartley works in communications at Cook+Fox and is a senior editor at Terrapin Bright Green. She would like to thank Mark Ruscio for his contributions to this article.