

The office

Innovative shading reduces glare, heat gain, maximizes daylight at 1050 K St.

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October 4, 2010

COMMERCIAL : GREEN, PROJECTS



Photos by Ron Blunt Photography, Washington, D.C. The 1050 K St. building achieved Gold certification from the U.S. Green Building Council's Leadership in Energy and Environmental Design program, earning 37 points.

Architects of Washington, D.C.'s new and sleek 1050 K St. describe the building as a sustainable interpretation of a modern glass box. The all-glass, 11-story, 136,000-square-foot building earned Gold certification from the U.S. Green Building Council's Leadership in Energy and Environmental Design program.

"The concept of large amounts of floor-to-ceiling glass for natural light and views was important from a marketing standpoint given the relatively small site," Jason Wright, associate architect for the project's design firm, Hickok Cole, Washington, D.C., says of the sustainable glass box design. "In order to maximize the glazing without sacrificing energy performance, careful attention was taken during the design and selection of the exterior skin system and materials."

The building features innovative glazing from top to bottom, starting with the low-iron point-support lobby enclosure. "The use of low-iron point-supported glass in large lites allows for the curtain wall to almost disappear, letting the stone walls, glass façade and planting flow seamlessly from inside to out," Wright says. The building is topped with a rooftop garden and a sloped-glass roof, which gives the glass box "a twist, or a tilt, depending on your perspective," says Tom Mifflin, government marketing manager for Wausau Window & Wall Systems, Wausau, Wis., the curtain wall, window systems and sunshade supplier. The sloped roof required custom dies, "which adds a little spice compared to a typical glass box," Mifflin says. "The resulting exterior highlights the sleek glass and adds texture with metal accents." In between, the building features high-performance floor-to-ceiling blue glass curtain wall with extensive sunshade systems.



The building's sustainable design relies heavily on glass and glazing, as the envelope can manage occupant comfort, reduce HVAC loads, increase natural light and reduce reliance on artificial lighting. "Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED certification," Mifflin says.

The building's sustainable design relies heavily on glass and glazing, as the envelope can manage occupant comfort, reduce HVAC loads, increase natural light and reduce reliance on artificial lighting. "Optimizing energy efficiency of building envelopes can result in as many as 10 points toward LEED certification," Mifflin says.

Daylighting was at the forefront of the 1050 K St. design. Exterior and interior offices are filled with natural light, thanks to the all-glass walls. "Daylighting is important in the office environment both from the stand point of energy conservation and user productivity. By providing floor-to-ceiling glass on the north and west sides and making glass the dominant partition on the east side, light penetrates all the way to the core, giving the tenant the opportunity to provide daylight to all of their employees," Wright says.

However, the all-glass design also presented architects with the challenges of solar heat gain and glare, which can hinder occupant comfort and energy costs. To avoid the potential problems, the team specified blue insulating, low-emissivity glass from Viracon, Owatonna, Minn., for the entire curtain wall. Additionally, the team designed for orientation, choosing the best-performing glazing products for the appropriate elevations.

1050 K St. sits on a corner lot at K St. and 11th St. NW, and building orientation significantly factored into the design, Wright says. "On the west façade, which receives the sun's strongest rays during the summer months, integral louvered sunshades were designed into the curtain wall along with deeper cap mullions to increase the amount of shading on the building without sacrificing views," Wright says. "In addition to the shading devices, a 50 percent ceramic frit is used up to the sill mullion on all floors to help further reduce the sun's impact, while maintaining the visual clarity of the skin from both the exterior and interior. On the north façade, which has softer daylight, the mullion articulation is designed with shallower cap profiles to capture as much daylight as possible."

Large sunshades, Wausau's ClearStory, were used on the south elevation, and custom, extended covers were installed on the west elevation, to provide shading during peak sun times. The sunshades were engineered and factory-assembled as integral to the curtain wall system, for smooth installation and field attachment, Mifflin says. "Sunshades intercept solar heat gain at the best place—before it can add to the HVAC system's load," he says. "Sunshades also can economize natural light by redirecting more deeply into occupied spaces. ... While tall conventional windows may work well in providing natural daylight to 'shallow' perimeter offices, more complex strategies are necessary to achieve daylighting in 'deep' south-facing spaces."

In the end, the design allows for reduced energy costs. "The combination of materials and design elements reduces the need for additional heating and cooling, and in turn allow the mechanical system for the building to be smaller and use less energy," Wright says.

Wausau Window & Wall Systems supplied the high-performance curtain wall and window systems, including the 7250 Unit Wall Series curtain wall and 4250-LP Low Profile Series fixed windows. "As part of the Advantage by Wausau standard products, the LP Series windows' narrow sightlines offer improved daylighting and views, lower U-factor and higher condensation resistance factor, and wider view," Mifflin says.

The building features 34,000 square feet of the factory-assembled and -glazed UW Series curtain wall, in 3-foot by 7-foot units—about 3,400 square feet of single- and double-span units were field glazed. The UW Series features an interlocking frame design to accommodate seismic, live load and thermal building movements, Mifflin says.

The aluminum systems all feature a low-maintenance, durable clear anodize on the exterior, and Bright Silver on the interior. Linetec, also of Wausau, Wis., was the glazing finisher.

Other players on the project included: glazing contractor, Harmon Inc., Minneapolis; and general contractor, Fairmont Builders, Bethesda, Md.



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