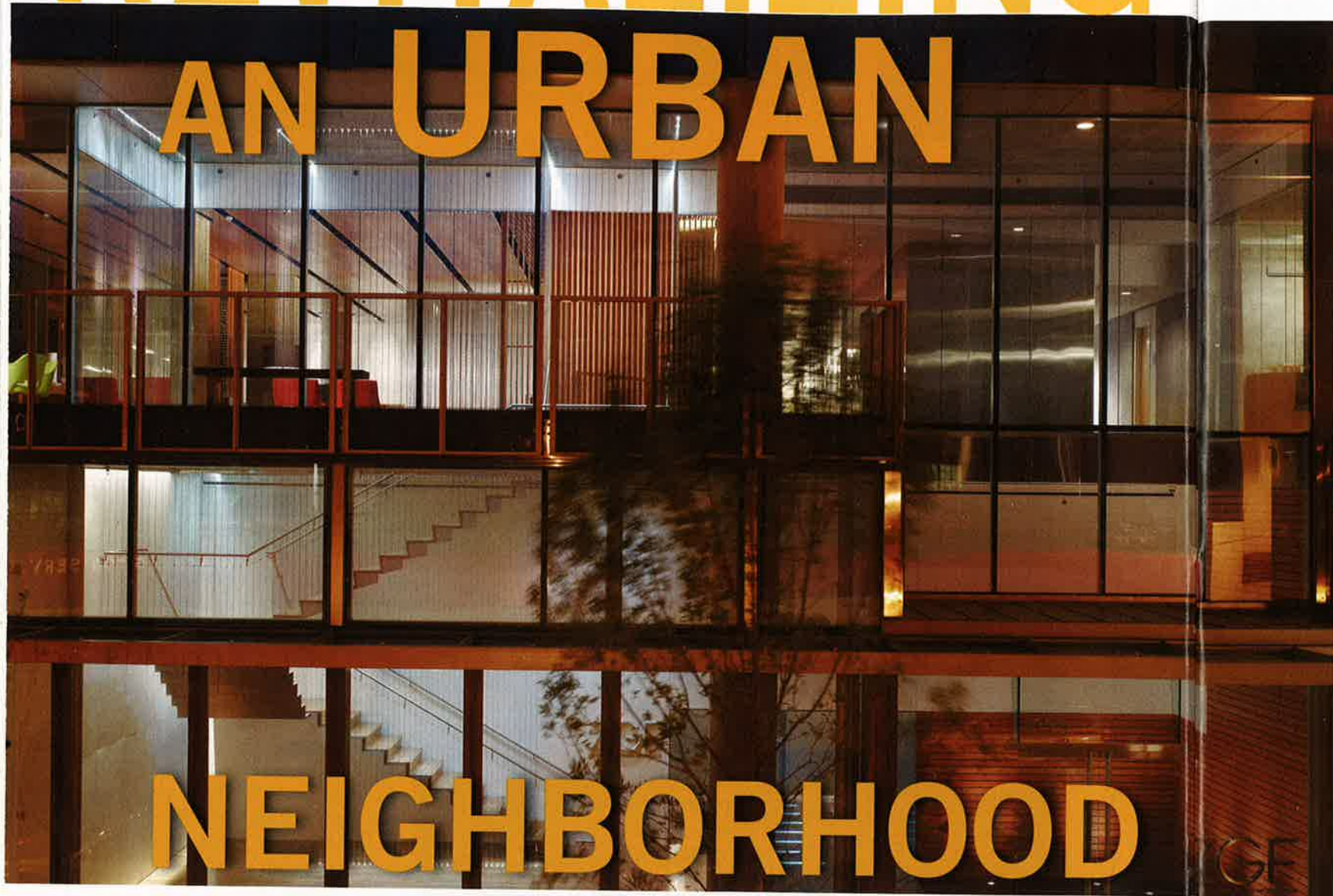


# REVITALIZING AN URBAN



# NEIGHBORHOOD

## THROUGH INTEGRATED DESIGN

■ By Peter van der Meulen

Portland, Ore., is widely recognized as one of the country's most environmentally friendly cities, noted for its focus on comprehensive urban planning, commitment to light rail investment and leadership in sustainable architecture. This focus on sustainability has contributed to decade after decade of double-digit population growth. This in turn has led Metro, a regional planning authority, to push for high-density, transit-oriented developments.



Overall energy use in Twelve West is being tracked, along with sub-metering data from office lighting and plug loads. A 47 percent reduction in potable water use is expected through use of efficient fixtures, low-water roof plantings and rainwater reuse. Photo Copyright Basil Childers

The City of Portland agreed to offset system development charges (SDCs) for the amount of waste diverted from the combined sewer credit, which funded 91 percent of the system cost, a \$204,840 savings.

Photo courtesy of Nick Merrick © Hedrick Blessing

This confluence of factors laid the groundwork for a nascent revitalization of the city's West End area. Located between the thriving, pedestrian-friendly Pearl District and Portland's Central Business District, the West End has a patchwork of surface parking lots ripe for development and historic properties ready for rejuvenation. Today, this rapidly transforming neighborhood is anchored by Twelve West, a mixed-use, sustainably-designed high-rise developed by Gerding Edlen Development Company, Portland, Ore.

Located on a site that was underused for decades as 20,000 square feet of surface parking and a derelict one-story building, Twelve West rises 23 stories and includes street-level retail space, four floors of office space, 17 floors of apartments and five levels of underground parking. In keeping with Portland's sustainable mindset, the building received Platinum-level certifications under both LEED New Construction and LEED for Commercial Interiors rating systems.

Completed in 2010, the building's office space was immediately 100 percent occupied. Within 10 months, apartment occupancy stabilized at over 95 percent. Currently, all but one of the retail spaces is leased.

Through the process of developing, designing and building this new Portland icon, the project team learned how collaboration and creativity, supported by rigorous validation and documentation of energy saving and green features, is imperative for successful sustainable architecture.

### The Take-Away

An integrated collaborative approach, a strong commitment to sustainable design strategies and a bold vision led to a building that has revitalized a neglected section of the city and is becoming a "living laboratory" for sustainable architecture. Several factors were instrumental to the success of the building, including:

- A centrally-located, urban site ripe for high-density development;
- A project team committed to sustainable design, innovation and collaboration; and
- Technical support and incentives for energy-efficient and green technologies.

### Maximizing Site Potential to Achieve High-Density

National firm ZGF Architects, LLP, headquartered in Portland, planted the first seeds of the project. In



The building site was chosen for its central, transit-rich location to encourage further dense development in Portland's urban core. Total project cost, excluding land, was \$138 million.

Funded with seed money by the ownership group, the wind turbines are predicted to generate roughly 10,000 kWh per year, enough to power the elevators.



Photos courtesy of Timothy Hursley

search of a new office space, the firm approached Gerding Edlen with the aim of developing a mixed-use, sustainable space that would serve as an on-going learning tool for the architectural community.

To achieve this goal, the project team needed a centrally-located site that could support a highly sustainable work-live environment. The team finally selected a site owned by City Center Parking, a business owned by the Goodman family, which owns numerous surface parking lots and garages in the downtown area. The Goodmans were exploring the idea of transforming their surface lots into models of high-density urban

design. They agreed that the site was optimal because of its central, transit-rich location, its potential to connect Portland's Pearl and Business Districts and its need for renewal.

After settling on the location, ZGF, Gerding Edlen and the Goodman family worked together to establish specific goals for the project, including:

- Create a mixed-used space that would be a model of healthy living and working environments;
- Establish a new office space for ZGF that would also serve as an on-going learning tool for the architectural community;

- Prioritize energy-use reduction and sustainable building techniques;
- Attain LEED Platinum certifications for New Construction and Commercial Interiors; and
- Offer residential units and retail space for locally-owned businesses.

Based on these goals, Gerding Edlen assembled a project team well-versed in urban design and sustainability. As a first step, every member of the team attended a collaborative project team meeting to formulate project goals and ensure the design would achieve LEED-Platinum certification.

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Led by ZGF, the project team included Hoffman Construction Company, Glumac Engineers and KPFF Consulting Engineers. Because energy-efficiency is critical when pursuing LEED-Platinum certification, the team also included Energy Trust of Oregon, a local non-profit organization that offers financial incentives and technical assistance for energy efficiency and renewable energy projects to customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas.

### Tax Credits and Energy Incentives Help Secure Financing

Gerding Edlen worked with Portland Family of Funds Holding, Inc., a local mutual benefits corporation that invests in economic development, to move the project into the construction phase by structuring and closing a \$29 million allocation of New Markets Tax Credits from Portland New Markets Fund. A construction permit loan was secured from Pacific Life Insurance Company, while existing equity made up the rest of the \$138 million project cost (land excluded). The developers also turned to Energy Trust for help identifying energy-saving and generating technologies that would qualify for cash incentives.

### Taking a Closer Look at Energy

Energy-use reduction was a primary driver of the design. To maximize the building's energy efficiency, the team worked closely with Energy Trust to identify innovative and proven energy-saving strategies. An energy analyst developed a detailed matrix with a number of proposed strategies to evaluate energy-savings potential, carbon reduction, cost, payback and interaction with other strategies on the list. The team updated the matrix as the simulation and design progressed, driving the most informed decisions. As a result, energy modeling predicted Twelve West would achieve an overall savings of 46 percent over Oregon energy code. Strategies put in place to achieve these results include:

- Daylighting;
- Natural ventilation;
- Night-flush of thermal mass;
- Occupancy sensors and continuous dimming ballasts;
- Advanced daylight controls on overhead lighting;
- High-efficiency mechanical equipment;
- ENERGY STAR® appliances;
- Chilled beams and hydronic baseboard heat for office spaces;

- State-of-the-art radiant low-E glazing to control heat gain;
- Highly-efficient building envelope;
- High-performance windows and doors;
- 1,360 square feet of flat-plate solar hot water collectors (providing 24 percent of the water heating demand for the building); and
- Integration of wind generation.

### Capturing the Breeze

To help meet the goal of creating a building that would be an on-going learning tool for the engineering and architectural communities, the project team committed to including a demonstration wind turbine rooftop installation. The design process for the wind turbines is an excellent example of the collaboration and creativity that were fundamental to the success of this project. Initial research by the design team, funded with seed money by the ownership group, was compelling enough to attract consultants and manufacturers from around the United States, some of whom worked for reduced fees in exchange for being a part of a

groundbreaking demonstration project. This involvement resulted in a comprehensive assessment of the wind resource at the site, including some limited direct wind speed measurement using an anemometer mounted on a crane. This research helped to determine the optimal location for the turbines and, on the higher level, test the viability of wind generation in an urban setting. Technical support and funding from Energy Trust and the Oregon Department of Energy were integral to the wind turbine installation. In the first year of operation, the wind turbines generated approximately 5,600 kilowatt hours per year. The design team will monitor wind resources against energy production for five years to determine if design predictions were valid, and to share results with the larger design community.

### Additional Green Strategies

A number of additional green strategies contributed to the sustainability of the project. The team made a commitment to use low-impact building materials, including salvaged and reclaimed wood, exposed concrete and natural materials.

Water conservation was also a high priority. The building uses 40 percent less water than similar mixed-use building types due to low-flow and dual-flow fixtures throughout the building. By landscaping with indigenous vegetation, irrigation water use is 84 percent lower than a building with standard landscaping. Rainwater harvesting meets all irrigation needs and approximately 90 percent of the office toilet-flushing needs.

The building's central location facilitates a car-free, pedestrian-friendly lifestyle, which reduces carbon emissions and supports high-density living. To further encourage alternative transportation, the building is within walking distance of bus, light rail and streetcar lines and provides secure bike storage, showers and locker facilities for cyclists.

As public knowledge of sustainability grows, so do suspicions of "green washing." To avoid this charge and secure consumer support, project teams must make informed design decisions, invest in the process and authentically strive for urban sustainability. Ultimately this project proves that done right, sustainable solutions will not only pay back handsomely in the form of lower energy costs and operating expenses, but also in faster and higher occupancy rates as tenants understand the benefits of living and working in high-performance buildings. ■

By Peter van der Meulen, associate partner, ZGF Architects LLP.

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