



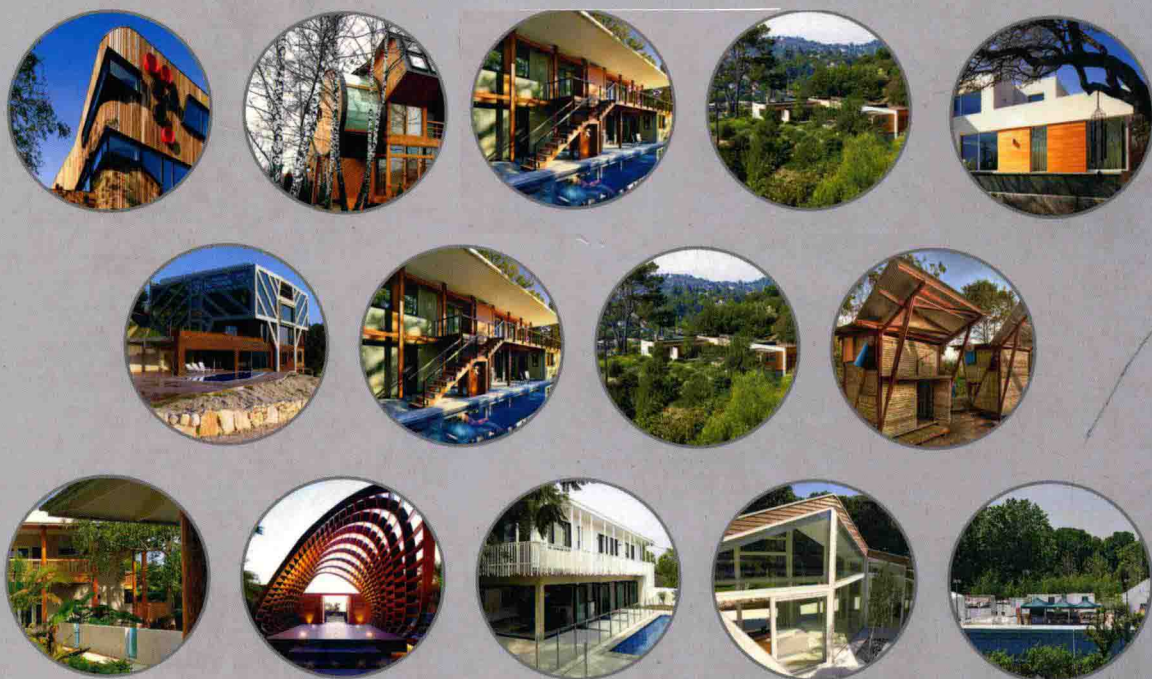
INNOVATION & BALANCE

RESIDENT ARCHITECTURE

Architectures with Energy Saving, Low Carbon, Environmental Materials, Technology and Reuse Ideas

创新与平衡 · 住宅建筑

综合商住 · 别墅 · 公寓



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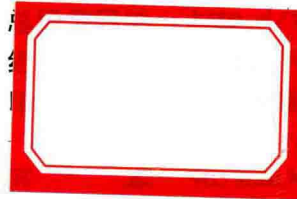
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创新与平衡·住宅建筑

综合商住·别墅·公寓

D. Schulz



Daniel Schulz
Architect - M.A. M.Arch. Dipl.-Ing.

Daniel Schulz, born in 1977 in Germany, was educated in the field of monument protection, sustainable and ecological design, possessing the German Diploma of Engineer in Architecture and later the International Master of Art in Architecture at the University of Wismar. In 2004, he continued and got a postgraduate Master of Architecture in China. After having design experiences in Germany and Australia, he went back to China as a principal architect for the Australian company, Jackson Architecture, at the branch office in Shenyang. Today, Mr. Schulz is leading the branch office in China as a project manager and principal architect. He has completed medium and large projects, among which are airports, stadiums, administration centers, hospital, office and residential designs. Each project designed in China includes ideas and expertise of ecological and sustainable design (ESD). With the issue of this book, he hopes not only to encourage designers to consider ESD in their designs, but also to inspire developers and investors of reconsidering ESD when taking actions and responsibilities for the future development. The book gives ideas of combining design and technical aspiration into the great architecture.

INNOVATION & BALANCE

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创新与平衡·住宅建筑

With the strong appeal from people on "low-carbon life", the rapid development of green economy and environmental protection has been representing the general trend worldwide. In particular, people increasingly focus on construction energy consumption accounting for about one third of the total energy consumption globally. As a result, with the beautiful desire of protecting habitat for humanity together, german senior architect Daniel Schulz elected as editorial adviser, editorial board of the book collaborate with authority in the field of architectural design all over the world, planning and compiling this series of classic work together. The work aims to enlighten readers and make them reflect on Ecological Habitat, thus initiate solutions for harmonious commensalism on human beings, architecture and environment.

Taking green design concepts such as energy saving, low carbon, environmental protection, reuse and sustainability as the main theme, this book has selected nearly 100 recent outstanding green architectural works worldwide. A wide variety of green works and perspectives are included, ranging from public buildings to private residences, from high-end architectural complex to affordable social housing, from strategies of passive energy saving to technologies of zero energy consumption. Along with specific planning drawings and professional conceptual introduction, readers are able to have a deep insight into how creatively the renowned architects express and interpret green concept. Meanwhile, professional readers can also aquire stronger competitive advance in this field and expand their business opportunities by studying these remarkable green design ideas in this book.

随着人们对“低碳生活”的强烈呼吁，环保、绿色经济的迅猛发展已经成为全球大势所趋。其中，约占世界总能耗1/3的建筑物能耗更日益成为人们关注的焦点。由此，秉承“携手保护人类家园”的美好愿景，本书编委与各国建筑设计界权威人士倾力合作，并推荐德国资深建筑师Daniel Schulz担任编辑顾问，共同策划编写了这套经典著作。希望能够借助此书带给人们更多关于生态人居的启发和思考，从而提出更多人类、建筑与环境和谐共生的解决方案。

本书以节能、低碳、环保、再利用、可持续性等绿色设计为主题，为读者精选出近100例新近期为突出的绿色建筑作品。从公共建筑到私人住宅，从高端建筑群到社会保障房，从被动式节能措施到零能耗领先技术，在书中都有所涵盖，同时配以详细的设计方案图和专业的理念解读，使读者可以充分领略到世界各地知名建筑师如何创造性地表现与诠释绿色理念。与此同时，专业读者通过对本书绿色创意的研究，将获得更大的行业竞争优势，利于拓展更多的商业合作机会。

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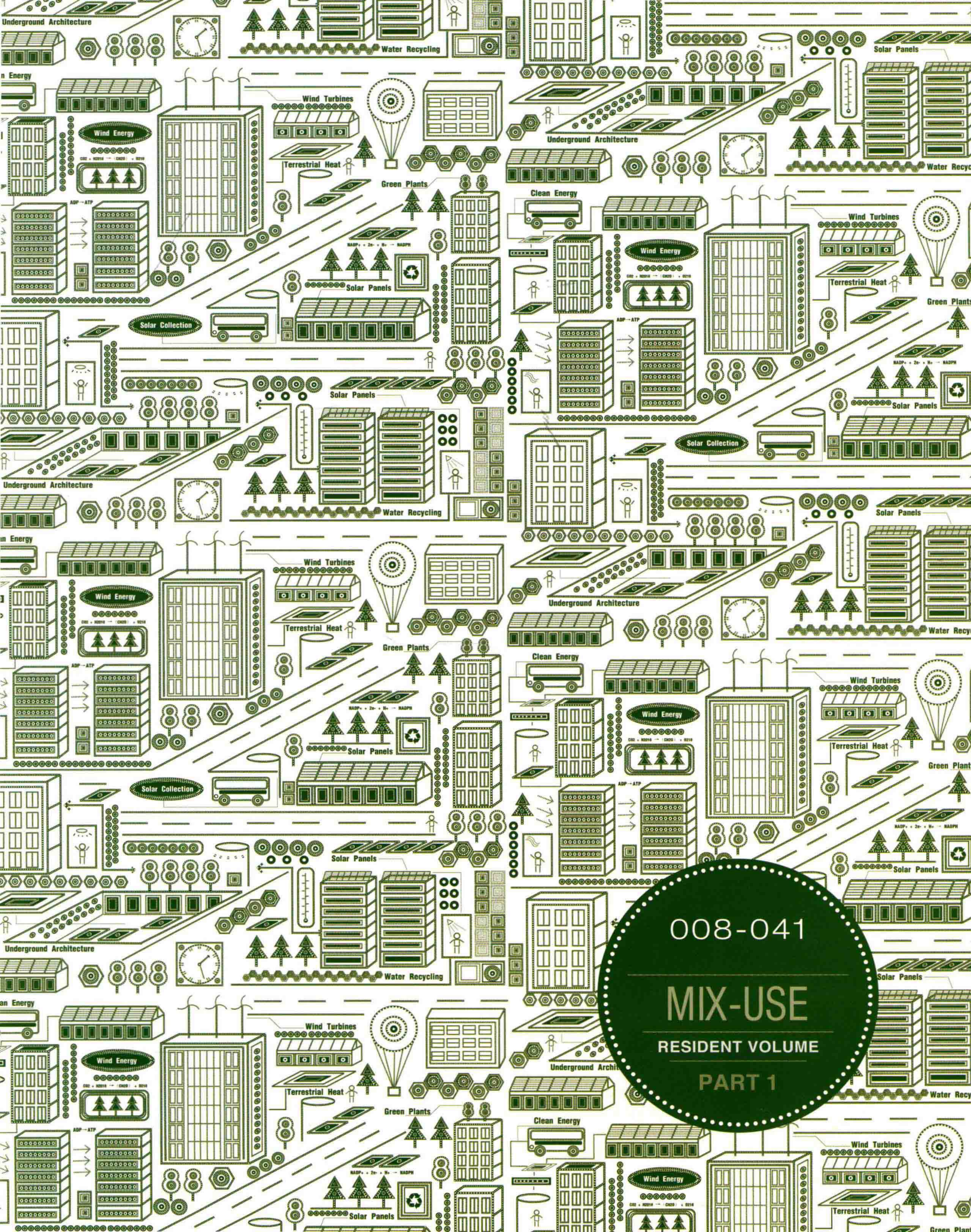
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MIX-USE
RESIDENT VOLUME
PART 1

Twelve | West Mixed-Use Building

Rising 22 stories above Portland, Oregon's evolving West End neighborhood, Twelve | West is a mixed-use building designed to meet two LEED Platinum Certifications and serves as a laboratory for sustainable design and workplace strategies. It features street-level retail space, 4 floors of office space for the architectural firm, 17 floors of apartments and 5 levels of below-grade parking.

The building has an eco-roof, rooftop garden and terrace space, complete fitness studio and a theatre. Four wind turbines sit prominently atop the building representing the first U.S. installation of a wind turbine array on an urban high-rise. Twelve | West serves as not only an anchor in a rapidly transforming urban neighborhood, but also as a demonstration project to inform future sustainable building design. The project is a catalyst for the next wave of redevelopment in this city's resurging downtown.

Twelve | West 位于波特兰市，与发展中的俄勒冈西区相邻，是一栋混合用途的大楼，其设计符合两项LEED铂金证书，还被作为可持续性设计和工作场所策略的实验室。沿街的一层是零售区，建筑公司占据了4层办公区，其余的17层是公寓，地下还有5层停车场。

大楼还配备生态屋顶、空中花园、露台、健身房和一家影院。楼顶的四台风力涡轮机十分醒目，它们还是首次出现在美国的城市楼顶，Twelve | West 不仅是这个日新月异的城市中的一个港湾，还是展示未来可持续建筑设计的一个重要工程。这一工程将对城市中心的新一轮改造起到促进作用。

Name of Project / 项目名称:

Twelve | West Mixed-Use Building

Location / 地点:

Portland, USA

Area / 占地面积:

51,096 m²

Completion Date / 竣工时间:

2009

Architecture / 建筑设计:

ZGF Architects LLP

Interior Design / 室内设计:

ZGF Architects LLP

Photography / 摄影:

Eckert & Eckert,

Timothy Hursley,

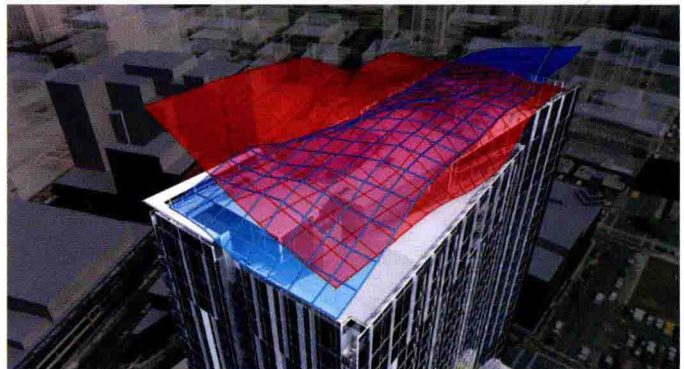
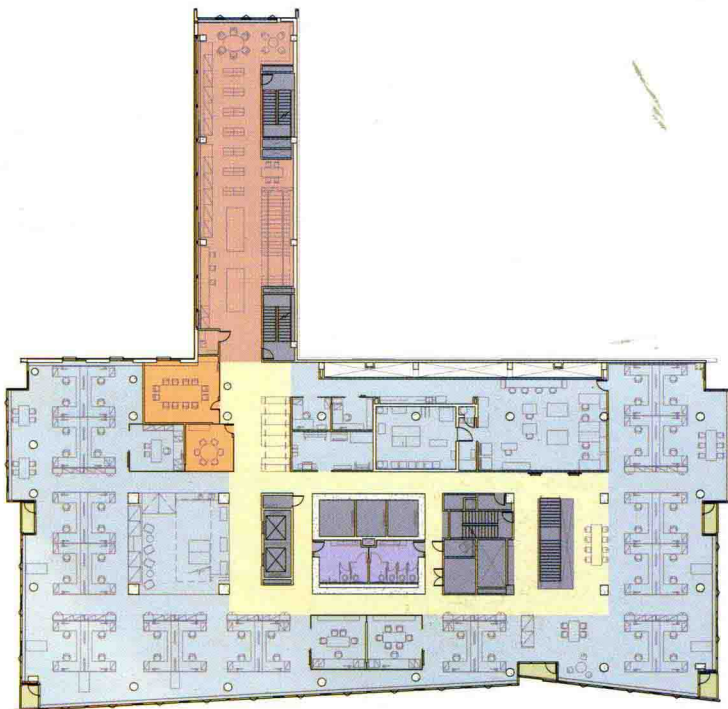
Nick Merrick © Hedrich Blessing,

Basil Childers,

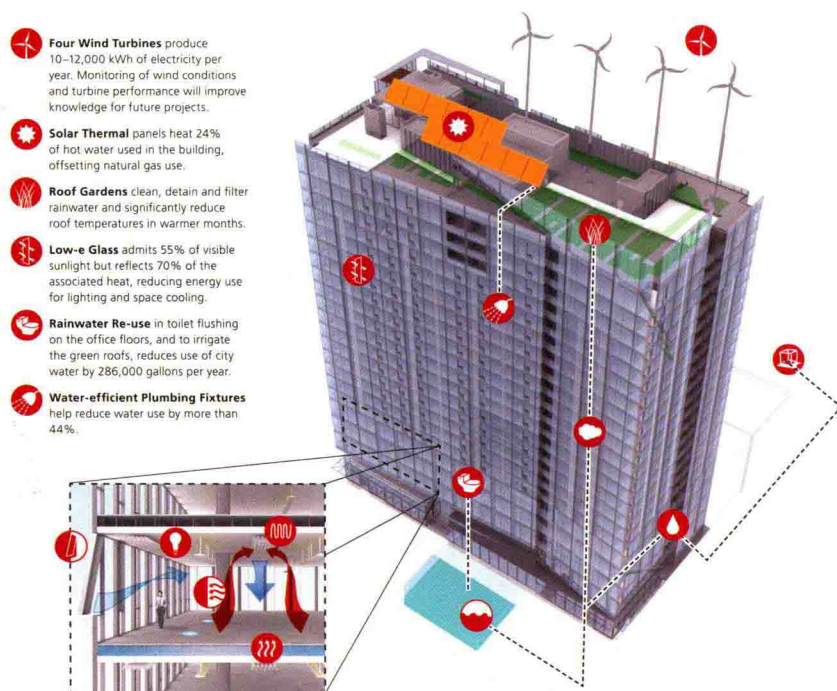
Sherri Diteman

Client / 客户:

Gerding Edlen Development Company







The design team made the bold decision to incorporate building-integrated wind turbines into the design of Twelve | West, a process that led not only to the mounting of four wind turbines on the tower's roof but, more importantly, to a body of research that will help advance the application of building-integrated wind power and provide a roadmap for other projects.

The turbines are predicted to generate roughly 10,000 to 12,000 kWh per year, enough to power the elevators. More importantly, the turbines will be thoroughly instrumented so that actual performance and wind flow patterns can be validated against predictions. Recognizing the groundbreaking rigor of investigation into this untested application, the Energy Trust of Oregon and the Oregon Department of Energy funded the entire system cost through energy efficiency grants and tax credits.

设计团队大胆地将建筑一体的风力涡轮机这一设计运用在 Twelve | West 项目中。这一设计的重要性在于不仅为建筑一体的风力电能应用提供研究，并且还可以为其他立项开创先例。

根据预计，涡轮机每年发出的电能为1万到1.2万千瓦时，足够为电梯供电。更重要的是，涡轮机完全以仪表进行测量，从而使其实际性能和风动情况都可针对预测进行验证。认识到这将是一项开创性的探索，俄勒冈能源信托基金和俄勒冈能源部通过节能补助和税收抵扣的方式为整个系统提供了资助。

- Four Wind Turbines** produce 10–12,000 kWh of electricity per year. Monitoring of wind conditions and turbine performance will improve knowledge for future projects.
- Solar Thermal** panels heat 24% of hot water used in the building, offsetting natural gas use.
- Roof Gardens** clean, detain and filter rainwater and significantly reduce roof temperatures in warmer months.
- Low-e Glass** admits 55% of visible sunlight but reflects 70% of the associated heat, reducing energy use for lighting and space cooling.
- Rainwater Re-use** in toilet flushing on the office floors, and to irrigate the green roofs, reduces use of city water by 286,000 gallons per year.
- Water-efficient Plumbing Fixtures** help reduce water use by more than 44%.
- Operable Windows** provide occupants fresh air, cooling, and a connection to the outdoors.
- Daylight Sensors** switch off electric lights when there is ample daylight, reducing lighting energy use by 60%.
- Exposed Concrete** moderates indoor air temperatures. Mass is cooled with cool night air in the summer months and absorbs excess heat throughout the day.
- Passive / Chilled Beams** provide energy-efficient cooling on the hottest days.
- Under-Floor Air Distribution** efficiently delivers moderate-temperature air directly to occupants. Personal adjustable floor vents provide control over ventilation.
- Water Storage Tank** temporarily stores up to 22,000 gallons of rainwater and condensation for re-use.
- Efficient Central Cooling** plant in the nearby Brewery Blocks provides chilled water for space cooling.
- Rain Water Harvesting** piping gathers 273,000 gallons of rainwater from the roofs.
- Condensation** of 13,000 gallons of water from the air handler system will collect during summer months.



