



CASE STUDY: Awards of Excellence for Affordable Housing Built Responsibly

REACH's Station Place Tower



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Station Place Tower

REACH has over 24 years of experience developing affordable housing in Portland, Oregon. In the last ten years, it has committed to developing green housing, and now completes all of its project in compliance with Earth Advantage standards, a leading green building program in the Northwest. Station Place Tower (SPT) grew out of a strategic planning process that included a market study that identified a need for senior apartments in the Pearl District. The project is outstanding not only in its commitment to build green, but also in the wide range of services it provides for seniors including free internet access, a library, a large community room, outdoor terraces, a computer lab, exercise room, two building managers and a Resident Services manager to coordinate extracurricular activities for the residents and assist them with any additional services they need. The development demonstrates significant insight into both green building innovations as well as the needs of senior citizens.

Greening Goals:

The greening goals of the project were to build a durable 100-year, low-maintenance, energy efficient, well-insulated building that uses 30% less gas, electricity and water than conventional buildings; use resources efficiently in the construction process; utilize alternative fuel sources and water recycling; create a healthy, safe and supportive environment for seniors; and create a building that is cost-efficient and replicable.

Integrated Design Process:

The integrated design process was highly effective and resulted in time and cost savings as well as innovative green features that may not have been accomplished without comprehensive planning at the outset. In addition, a design charette brought together all members of the project team to discuss the City's affordable housing guidelines. This meeting generated further discussions and meetings about how to go beyond standard guidelines for efficiency and safety.

Project at a Glance

Location: Portland, OR
Project Type: New Construction
Ownership/Rental: Rental
Size:
 176 units (1-2 BR)
 154,359 total sq. ft.
 .51 acres; 176 units per half-acre
Project Completion Date: Dec. 30, 2004
Affordability:
 All units are for residents earning 80% or less of the Area Median Income (AMI). Over 40% of the units are for people below 30% of the AMI (\$14,250 for one person).
Project Team:
 Developer: REACH Community Development, Inc.
 Architect: Leeb Architects
 Contractor: Andersen Construction Company

Development Cost:

Land cost:	\$1,432,000
Construction costs:	\$18,994,000
Soft costs:	\$ 7,474,000
Total:	\$27,900,000

Cost/Savings of Greening:

Documented increased Cost of Greening:	\$950,000
Rebates and Grants:	\$70,000
Net Cost of Greening:	\$920,000

Standards Used: Earth Advantage Homes, Portland Development Commission standards for green building

Key Green Features:

- Brownfield reclamation
- Close proximity to city transit
- Energy Star appliances
- Energy and water saving faucets
- Dual flush toilets
- Fluorescent light fixtures
- Rainwater harvesting system
- Eco-roofs
- Roof-top community garden on top floor
- Low VOC paints and adhesives



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Green Features

Site Design/Landscape Planning:

Station Place Tower was built on a brownfield site that had previously housed a rail yard. Several organizations, including the City, the Oregon Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) worked closely to make sure the dangerous deposits of toxins were removed and disposed of properly. The area was backfilled, and the building was constructed with the least disturbance of contaminated soils possible. Other precautions, such as an underground vapor mitigation system, a vinyl vapor barrier and geo-textile fabric were added to the development to ensure that the site posed no harm to the residents. Thus, the toxins that remain in the soil are stabilized and are expected to dissipate over time.

The site is close to the Willamette River, and there are views of the river, Mt. Hood and Mt. St. Helens on every occupied floor of the building. The building faces south to maximize solar gain and minimizes western exposure to reduce overheating in the summer and exposure to freezing winds from the east in the winter. The adjacent five-story parking garage was situated with the goal of reducing noise from the railroad station.

Location and Linkages:

SPT is located in the Pearl District, one of Portland's most vibrant and evolving neighborhoods. The building is on a bus

line and is one block from the Portland Streetcar. The Amtrak and Greyhound stations are less than one-quarter of a mile away. As such, downtown Portland is easily accessible to the senior residents. In addition, the building is a short walk from parks, the Willamette River esplanade, stores, restaurants and cultural attractions. A walking path on the south side of the building connects the train station and the rest of the neighborhood, and two large bicycle storage rooms are located on the first floor of the building.

Building Design Greening:

Energy: The building has effective insulation that surpasses the Oregon commercial code. Because of the efficiency of the insulation, both heating and air conditioning systems were down-sized. Based on an energy modeling program and cost-savings analysis, personal thermal air conditioning systems (PTACs) were installed with a heat pump feature. The systems were selected for their high efficiency and low operating costs in the mild Northwest climate. All gas heat furnaces and water heating units are rated at 90% efficiency or above and the air conditioners are reused from other buildings. In addition, the two elevators in the building, potentially large users of electricity, were selected for their efficiency, consuming 40% less electricity than typical traction elevators. Furthermore, the use of T8 fluorescent and compact fluorescent lights also decreases energy consumption.

Indoor Environmental Air Quality: Though the building is well-insulated, a superior ventilation system ensures that the units have excellent indoor air quality. On a continuous basis, moisture and odors are exhausted and fresh air is drawn into the units from the corridor HVAC. All units and corridors have windows, and each floor has at least one common balcony. Three different floors have outdoor terraces, and the 14th floor has a large terrace with a community garden



for the residents. In addition, cabinets are made from plywood instead of particle board to minimize off-gassing and enhance air quality, paints and adhesives are low VOC, no pesticides or herbicides are used on site, there is no smoking in the common spaces, and separate vented storage facilities house the cleaning supplies and paints.

Resource Conservation/Materials: Little waste was generated from the construction of the concrete building frame. The exterior skin was prefabricated to minimize waste, and the architect carefully designed the window placement and brick coursing to reduce waste. Most of the waste generated from the framing and exterior skin was easily recycled, and all drywall scraps, along with cardboard and wood, were recycled on site. The contractor employed a single hauler to take waste to the local recycling facility, and the contractor enforced the separation of waste materials by the subcontractors.

Most of the materials used were environmentally preferable and had recycled content, including the drywall, carpeting, and aluminum window wall and panel system. In addition, the development team made an effort to purchase as many materials as possible from within 500 miles of Portland which helped to minimize fuel consumption from the transportation of materials.

Water Conservation: The development team made great efforts to recycle stormwater runoff and reduce the use of

Measurable Benefits

- Storage of 9,500 gallons of rain-water to flush toilets
- All gas heat furnaces and water heaters are $\geq 90\%$ efficiency
- Elevators consume 40% less energy than conventional elevators
- All paints/adhesives are low VOC (50 g/l or less)



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Green Features

potable water, despite the availability of a new storm sewer. The rainwater is collected off of all roofs that do not have terraces nor are covered by an eco-roof (covered in plants). The water feeds into an 18,000 gallon concrete storage tank and replaces the use of potable water to flush 80 of the building's toilets. The tank was combined with the required 7,500 gallon back-up fire water tank to save construction costs and materials required for a second tank.

All landscaping on site uses native plants or those that have low water requirements. Two terraces have permanent plantings and a roof-top garden has both permanent plantings as well as garden space for the residents. All planting spaces have buried drip irrigation systems. In addition, all shower heads are 2 gal/min, kitchen faucets are 1.5 gal/min, bath lavatories are .5 gal/min, and toilets are dual flush with .8 or 1.6 gal flushing.

Commissioning: Building commissioning was completed and a full "start and balancing" commissioning report was done to evaluate the HVAC systems.

Operations and Maintenance: At the time of building commissioning, the construction manager, facilities manager and maintenance staff spent 2 full days touring the building, examining the systems, and discussing the greening goals and concerns.



Subsequently, training on the specific systems was provided to maintenance staff by the relevant subcontractor, in conjunction with additional training sessions lead by the construction manager.

Resident Education: When residents move in, they receive a packet of information about green building, the various systems in their home, the building's recycling guidelines, public transportation, fire and safety features, maintenance procedures, resident services programs and a directory for other services. In addition, the building manager walks residents through their units, demonstrating the most efficient and healthful ways to use their systems and appliances. Further, the construction manager periodically makes presentations at resident meetings about the green building features.

Project Financing:

Project financing was provided by Wells Fargo Bank, the Portland Development Commission, including Urban Renewal Area funds, bridge bonds and 76 project-based Section 8 certificates.

Cost of Greening:

The incremental costs of greening SPT totaled \$950,000 and were all covered so that rents were not increased due to the incorporation of green features.

Sources of Funding/Rebates:

The Portland Office of Sustainable Development provided a \$70,000 grant, as well as in-kind support, for the rainwater harvesting system. The Portland Development Commission provided funding for all remaining costs of green features.

Life-Cycle Cost Analysis:

An LCC analysis was not done for the overall project. Nevertheless, environmentally preferable materials were chosen whenever possible and various pay-back analyses were done to decide whether certain features were cost-effective.

Occupant Satisfaction:

"Our decision to move to Station Place Tower was made quickly after looking at the offerings there....When we first visited, we were enormously impressed with what we found...Station Place Tower is 100% quality."

—Station Place Tower Resident

Green Highlights

- Adheres to Earth Advantage certification system
- Energy Star appliances
- Aluminum, thermal-break, low-e windows with a U-value of 0.34
- Insulation values range from R-11 to R-38
- Energy efficient heat pumps
- Rainwater harvesting system
- T8 and compact fluorescent lighting
- Timer for exterior lighting
- Recycled-content drywall, carpeting and metal aluminum window wall and panels
- Low VOC paints and adhesives
- Plywood cabinets instead of particle board
- Most materials purchased from within 500 miles of Portland



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Looking Ahead

Challenges:

REACH faced many challenges in the development of Station Place Tower. Perhaps the most significant was the environmental challenge of cleaning up the brownfield site on which the development is located. REACH successfully completed the clean-up with the dedicated assistance of the City and several other parties.

The team faced regulatory challenges as well with regard to the rainwater harvesting system. Regulations in Portland required the use of flush-o-meter or power-assisted flush toilets. REACH wanted instead to use regular gravity toilets to reduce both maintenance costs and noise pollution from the standard toilets. They were able to successfully negotiate with the City's plumbing department and use gravity flush toilets. In addition, for any organization, the challenge of obtaining comfort for seniors while also reducing energy use by 30% is significant; yet REACH was able to balance both goals and create comfortable and environmentally-responsible homes.

Partnerships:

REACH worked closely with the City of Portland, the Portland Development Commission, Oregon Department of Environmental Quality and the Environmental Protection Agency to clean-up the brownfield site. Its strong relationship with City agencies and other organizations in Portland makes the development team an exemplary model of a lasting and innovative partnership.

Policy/Practice Implications:

The rainwater harvesting system implemented at Station Place Tower—the largest residential rainwater harvesting and reuse system in Portland—demonstrates the benefits of an integrated design process and strong leadership in pursuit of innovative goals. The cooperation of funders, City agencies, and the design and construction teams resulted in a groundbreaking and exemplary effort that will inform future projects in the area and around the country.

“In developing Station Place Tower, REACH was extremely thoughtful and responsive to the needs of its senior tenants—from the library, to the exercise room, the outdoor terraces and the roof gardens. Moreover, locating the project in the highly desirable Pearl District neighborhood helps meet REACH’s and the City’s broader objective of providing diverse and affordable housing opportunities throughout the City.”

-Member, Awards Advisory Committee

Contacts



REACH Community Development, Inc.

503-231-0682

<http://www.reachcdc.org>

Dee Walsh, Executive Director

dwalsh@reachcdc.org

Kevin Kraus, Construction Manager

kkraus@reachcdc.org

Leeb Architects

503-228-2840

www.leebarc.com

Robert Leeb AIA, Principal Architect

robert@leebarc.com

Andersen Construction Company

503-283-6712

www.andersen-const.com

David Andersen, President

dandersen@andersen-const.com

KPFF Consulting Engineers

503-227-3251

www.kpff.com

Steve Murray, Civil Engineer

Steve.murray@kpffcivilpdx.com