



panels and reused the existing piping, pumps and basement storage tanks. The residential units feature ENERGY STAR® appliances and the detox center is served by a custom high-efficiency freezer and commercial refrigerator. Finally, the team installed ENERGY STAR windows throughout the building and hung shades and drapes for additional solar control.

Penciling out an affordable hotel conversion

A combination of \$37,586 in Energy Trust incentives and nearly \$42,000 in annual energy savings made the project a sound decision for Central City Concern. Incentives helped offset the cost of high-efficiency heating and cooling equipment, lighting and lighting controls and roof insulation. Ongoing operational savings are also helping to keep housing costs low, which allows the agency to invest more in support services.

In addition to injecting new life into an under-utilized building, the project is expected to spur further urban renewal in the Rose Quarter neighborhood.



Learn more about energy solutions for your new construction or major renovation project. Visit www.energytrust.org or call **1.866.368.7878**.

BUILDING A SUSTAINABLE COMMUNITY

CENTRAL CITY CONCERN REVITALIZES A LOCAL NEIGHBORHOOD WITH AFFORDABLE, ENERGY-EFFICIENT HOUSING

Central City Concern saves and transforms the lives of people struggling with poverty, homelessness and addiction. The nonprofit agency provides safe, affordable housing and health and recovery services to very low-income and formerly homeless residents in the Portland metro area. It has renovated and restored 23 properties in Portland's inner-city neighborhoods, and prioritized energy-efficient strategies and equipment in each project. These techniques help control and reduce energy costs—a key component in keeping housing affordable and maximizing the funds directed to recovery services—and qualify for state tax credits and Energy Trust of Oregon incentives. Results from incorporating efficiency have been so impressive that it aims to achieve net-zero

energy use in all its buildings by 2030. Through its commitment to urban renewal, the agency is transforming neighborhoods as well as people's lives.

Central City Concern's most recent sustainable renovation project is Madrona Studios. Formerly a vacant Ramada Inn in Portland's Rose Quarter renewal district, the 126,624 square foot, five-story building has been transformed into 176 low-income studio apartments and a ground-level in-treatment center. Thanks to sustainable practices, energy efficiency and renewable power, the building uses 27 percent less energy than a standard building of the same size for annual energy cost savings of nearly \$42,000.

Energy Trust of Oregon 1.866.368.7878 energytrust.org

Energy Trust of Oregon is an independent nonprofit organization dedicated to helping utility customers benefit from saving energy and tapping renewable resources. Our services, cash incentives and energy solutions have helped participating customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas save on energy costs. Our work helps keep energy costs as low as possible, creates jobs and builds a sustainable energy future. Printed with vegetable-based inks on paper that contains 100% post-consumer waste. 4/11





Building selection and project funding

The original facility included 184 guest rooms, a restaurant and meeting spaces. While a bit run-down, the building was structurally sound, within an urban renewal district, close to bus and light-rail lines and equipped with a large first floor space for a planned drug detoxification center. It was also close to a large population of minimum wage workers who could benefit from affordable housing.

Central City Concern bought the building in 2004 and almost immediately involved the Housing Development Center, a nonprofit organization that provides project support and management to nonprofit housing developers.

Economic conditions posed a significant challenge to securing funding for the \$25 million project; however, the agency finally identified a creative solution to this issue. The ownership of the building was separated into two legal entities. One, comprised of 96 workforce and 36 supportive housing units on the top three floors, was funded by \$7.1 million low-income tax credit equity from US Bank and \$5.2 million in tax increment financing from the Portland Development Commission. The 44 drug-and-alcohol free supportive housing units on the second floor and the first floor detox center were funded through the second entity with \$2.8 million in New Markets Tax Credit equity from Wells Fargo and \$3.7 million in bond financing from the Portland Housing Bureau.

Building goals and design strategy

With funding secure, the agency recruited a project team with experience in affordable housing and energy-efficient design. A grant from the Enterprise Foundation, an organization dedicated to ensuring every American lives in a decent and affordable home, paid for an eco-charrette attended by the project team. This four-hour working session produced the following project goals:

- Provide quality, affordable housing for residents
- Construct a durable building that could stand the test of time
- Incorporate energy generation, energy efficiency and water-saving strategies to reduce utility bills
- Cut energy utility costs by 25 percent

Energy efficiency and resource conservation

The project team identified numerous opportunities to cut water and energy use. To reduce water consumption, all residential units were equipped with low-flush toilets, low-flow showerheads and low-flow faucets in the kitchens and bathrooms. To reduce energy use, the project implemented a number strategies, many of which qualified for Energy Trust incentives and state tax credits.



HVAC systems

To reduce the heating and cooling load, the team considered installing a water loop heat pump system, supplemented by gas boilers; however, installing piping throughout the existing structure would be costly, potentially negating energy cost savings. In order to minimize construction costs, the team explored energy-efficient solutions to heat and cool the building using original structural features.

This approach inspired a closer look at the inn's existing guest rooms. Each was equipped with a through-the-wall air conditioner and heating unit. These existing wall openings were retrofitted as installation points for high-efficiency air-cooled heat pumps. The heat pumps are backed-up by efficient electrical heating, which switches on when the outside air temperature drops below 42 degrees. To overcome the challenge of occupant behavior, a central control center was installed. Occupancy sensors ensure fully conditioned air only flows when residents are home.

Providing heating and cooling for the detox center presented more challenges. Weight constraints on the existing lower roof limited the number of rooftop-mounted heat pumps that could be installed. As a result, the team installed only seven packaged rooftop heat pumps. High-efficiency gas furnaces and split system air conditioning units service areas not covered by the heat pumps. All the rooftop units boast economizer cycles for free cooling. The center also has occupancy controls and programmable thermostats so staff can set and lock the temperature.

Additional energy saving features

To further cut energy use, the team installed energy-efficient lighting throughout the interior and exterior of the building. Occupancy sensors control lighting in the detox center, interior corridors and around the perimeter of the building. In addition, the roof insulation installed exceeds code requirements. The wall insulation was left as is after an energy analysis showed increased wall insulation would actually increase cooling costs during warmer months, resulting in a net energy use gain. The team also revived an existing solar hot water system previously used to heat the facility's swimming pool. They replaced the existing

PROJECT TEAM

- Architect—William Wilson Architects PC
- Mechanical/electrical/plumbing engineers—R & W Engineering, Inc.
- Project support and management—Housing Development Center
- Sustainability coordination—Green Building Services
- Construction—Howard S. Wright Construction

PROJECT ACHIEVEMENTS

- Maximized energy efficiency and water use reduction
- Reused features of the existing building to keep construction costs as low as possible
- Provided quality affordable housing and recovery services
- Participated in the revitalization of an urban renewal district

UTILITIES

- Pacific Power
- NW Natural

“ A reduction in energy consumption enables us to keep housing costs low so we can increase the amount of supportive services we can provide. Energy Trust has been a great partner in helping us identify areas of opportunity for greater efficiency and, just as importantly, in identifying incentives which can help make those opportunities become reality.

Sean Hubert,
director of housing
Central City Concern

