

# IRONHORSE AT CENTRAL STATION

*Affordable Apartments Topped  
with Green Roofs and Solar Panels*



PHOTOGRAPH BY KEVIN WILCOCK, DAVID BAKER + PARTNERS, 2010

## In Oakland, California,

a development of 99 affordable apartments called Ironhorse has broken new ground. It is one of the first projects built by developer BRIDGE Housing to be GreenPoint Rated and

has been recognized with a GreenPoint Showcase Award for Achievement in Multifamily Housing. Ironhorse is also BRIDGE's first project to be rated as a Bay-Friendly Landscape and their first to include green roofs. StopWaste.Org's green building and Bay-Friendly Landscaping programs provided green consulting and a \$55,000 grant to Ironhorse to assist with both the GreenPoint and Bay-Friendly ratings.

BRIDGE Housing's decision to include green roofs was made with the help of an internal committee organized to look at sustainability measures, said Julia Anderson, Assistant Project Manager at BRIDGE. Over the years, the committee has developed a list of standard green building measures that are implemented in all BRIDGE developments, and has a screening process to identify additional suitable sustainability measures for new developments.

"We're always keeping our eye out for emerging technologies," Anderson said.

Ironhorse is part of a new 29-acre master planned community built by several developers on abandoned former industrial land not far from where the Bay Bridge touches down in Oakland. The Central Station area takes its name from a historic Southern Pacific railroad station that has been shuttered since the 1989 Loma Prieta earthquake but is slated for restoration. When fully built out, Central Station will include a mix of more than 1,200 market-rate and affordable homes and apartments.

### **COST**

\$41.4 million

### **LOCATION**

1801 14th Street  
Oakland, California

### **PARCEL SIZE**

1.6 acres

### **BUILDING SIZE**

153,395 sq. ft.

### **BUILDING TYPE**

99-unit affordable family housing

### **COMPLETION DATE**

November 2009

### **OWNER/DEVELOPER**

BRIDGE Housing Corporation  
San Francisco, California

### **ARCHITECT**

David Baker + Partners, Architects  
San Francisco, California

### **LANDSCAPE ARCHITECT**

PGAdesign Inc.  
Oakland, California

### **GENERAL CONTRACTOR**

J. H. Fitzmaurice, Inc.  
Oakland, California

### **LANDSCAPE CONSTRUCTION**

**CONTRACTOR**  
Shooter & Butts, Inc.  
Pleasanton, California

### **GREENPOINT RATER**

KEMA Services, Inc.  
Oakland, California

### **BAY-FRIENDLY LANDSCAPE RATER**

Sentient Landscape, Inc.  
Sebastopol, California

### **CONTACT FOR MORE INFO**

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Designed by David Baker + Partners, the four-story Ironhorse building wraps around a spacious central courtyard built over an at-grade parking garage. Green features include a large solar electric system, solar hot water panels, and vegetated swales that naturally filter stormwater runoff.

## ■ What Makes It Green ■

### SITE CONSIDERATIONS

**Green Roofs.** Ironhorse’s two green roofs cover the community room and the leasing office. With a total surface area of 1,387 square feet, the green roofs are not large but they represent a new step forward for BRIDGE. Green roofs are “cutting edge in the world of affordable housing,” said Anderson. The ongoing cost of maintaining the green roofs was initially a concern, she said, “but we’ve been able to find landscape maintenance vendors that have green roof experience and that are competitive in their pricing.” A third and more intensive (deeper planting base) green “roof” is actually the courtyard garden; it sits on the building podium above the parking garage.

Vegetated roofs have many benefits. They help keep the building and surrounding area cooler, reducing the need for air conditioning. They provide good sound insulation and may last longer than conventional roofs. They provide wildlife habitat, and capture some of the rainfall that falls on the site, filtering out pollutants before the runoff flows into storm drains and local waterways. Ironhorse’s two extensive green roofs were planted with a mix of four sedums (*Sedum k. Variegatum*, *Sedum John Creech*, *Sedum Red Carpet* and *Sedum sieboldii*) and two other ground covers (*Talinum calycinum* and *Delosperma nubigenum*). These fleshy-leaved perennials need little summer water and have colorful blooms, enhancing the view from Ironhorse’s apartments.



## GREEN at a GLANCE

**GREENPOINT RATED SCORE: 146 POINTS**

### PLANNING & DESIGN

- High density, urban infill development
- Good access to public transit, schools, neighborhood services and bicycle path network; bicycle storage provided
- Reduced parking capacity (1.1 spaces per unit) encourages alternative modes of transportation
- Outdoor social gathering places include central courtyard and community garden
- Designed for safety: main entrances are prominent and visible from street; exterior concrete walls have graffiti-resistant paint
- Designed for accessibility: all units designed to accommodate visitors with physical disabilities and can be easily altered for residents with special needs
- All units designated for families at or below 50% of area median income

### SITE

- Bay-Friendly Landscaping practices followed (see below)
- Over 90% of construction and demolition debris was diverted from landfill
- Construction indoor air quality management plan written and followed
- At least 30% of site includes cool site strategies (covered parking, landscaped courtyard, green roofs, streetside plantings, shade trees)

### STRUCTURE

- 22% recycled flyash used in concrete
- Optimum value engineering: door and window headers sized for load; used only jack and cripple studs required for load
- Raised heel roof trusses used to provide space for additional insulation
- Green roofs on community room and management office

## GREEN at a GLANCE

### SYSTEMS

- Low-flow fixtures include showerheads ( $\leq$  1.6 gpm), kitchen faucets ( $\leq$  2.0 gpm) and bathroom faucets ( $\leq$  1.5 gpm)
- High efficiency dual-flush toilets installed
- Radiant hydronic baseboard heating served by 92% efficient condensing boilers and premium efficiency pumps; no forced air heating in residences
- Air conditioning system in common areas uses non-HCFC refrigerant (R-410A); no air conditioning in units
- Kitchen range hoods and Energy Star bathroom fans vented to the outdoors; bathroom fans controlled by humidistats
- Solar hot water panels provide about 60% of heat for domestic hot water
- 130 kW photovoltaic system expected to meet 80% to 90% of electricity for common areas
- Exceeds Title 24 by 17.7%

### FINISHES & FURNISHINGS

- Low-VOC interior paints and construction adhesives used
- Cabinet shells are medium density fiberboard made with formaldehyde-free adhesives
- Carpet is CRI Green Label Plus certified for low emissions
- Units have Energy Star-qualified refrigerators and dishwashers
- Central laundry facilities have Energy Star-qualified clothes washers
- Built-in recycling centers installed in units; side-by-side chutes for trash and recycling installed in all trash rooms
- Low-mercury linear and compact fluorescent lighting installed

### OPERATIONS & MAINTENANCE

- Contracted with landscape maintenance company specializing in green landscaping techniques
- Tenants provided with green home care manual
- Computer displays in lobby show real-time solar electricity generation and provide information about the neighborhood and the property's green features

## ENERGY & CLIMATE CHANGE

**Renewable Energy Systems.** On a conventional building, a roof isn't expected to do much more than protect occupants from the elements, but at Ironhorse the roof actually helps reduce the project's carbon footprint. In addition to the two vegetated roofs, the roof supports a large solar electric system as well as solar hot water panels. "We're using the roof space to its maximum capacity," said Anderson. The 130-kilowatt photovoltaic system will produce more than 225,000 kilowatt-hours per year of electricity, which BRIDGE expects will meet up to 90 percent of the electricity used by the building's common spaces. The solar hot water panels will provide about 60 percent of the heat for the residents' domestic hot water.



## ■ Bay-Friendly Landscaping Practices ■

To create a landscape that serves the residents' needs, complements the architecture and meets Bay-Friendly requirements, "it's really important that the team is on board and working together," said Shawn Freedberg of PGAdesign, the project's landscape architect. "This was a really good team on that level," he said, crediting BRIDGE Housing with providing the driving force to make the entire project more environmentally sustainable. "At the end of the day they believe in this," Freedberg said.

### LANDSCAPING LOCALLY

The focal point of Ironhorse's landscape is a large outdoor courtyard built over a parking structure and ringed by apartments. The courtyard includes a play area, places for sitting and socializing, and a community room that spills out onto a circular patio area. Two small lawns enhance the recreational function of the courtyard and are sized to minimize water use. Deciduous trees including coral bark maple (*Acer Sango Kaku*) and honey locust (*Gleditsia triacanthos Sunburst*) provide summer shade. A variety of other climate-appropriate plants, including agave (*Agave americana*), New Zealand flax (*Phormium tenax Amazing Red*), and Western sword fern (*Polystichum munitum*), offer appealing colors, textures and shapes.



The courtyard presented a unique condition for planting. "Most of it only has about 24 to 30 inches of soil," said Freedberg. "It's potentially a very hot area because of sun bouncing off of adjacent walls. It's also shady because of the adjacent building." PGAdesign did sun and shade studies to help determine which plants would work well in the different microclimates, Freedberg said. Organic amendments were added to all planting areas to create healthier, more biologically active soil.

At street level, deciduous trees including red maple (*Acer rubrum*), California buckeye (*Aesculus californica*) and maidenhair tree (*Ginkgo biloba*) shade the building's south and southwest sides. Community garden

## BAY-FRIENDLY at a GLANCE

### BAY-FRIENDLY RATED LANDSCAPE SCORE: 72 POINTS

#### LANDSCAPE LOCALLY

- Site analysis completed to maximize benefits of Bay-Friendly Landscape practices
- Laboratory soil analysis provided recommendations for organic soil amendments and fertilizers

#### LANDSCAPE FOR LESS TO THE LANDFILL

- Plant species installed will not require shearing and will grow to mature size within space allotted; overplanting and tight spacing were avoided
- No invasive species were planted
- 100% of compost and mulch used was produced from local recycled plant waste
- At least 50% of landscape construction waste was diverted from landfills
- Plant debris was taken to a facility that produces compost and mulch
- Recycled-content materials include play structures (minimum 23% recycled) and play surfaces (minimum 20% recycled); outdoor benches, seat walls, raised planter beds and patio decks are made from composite lumber containing 50% recycled or reclaimed plastic and 50% reclaimed wood

#### CONSERVE WATER

- More than 80% of the installed plant species require only infrequent or occasional summer water
- Compost and mulch was used to increase soil's moisture retention
- High efficiency irrigation system includes drip and bubbler emitters and weather-based, smart controllers
- Irrigation submeter used to track water use and help to quickly identify potential system malfunctions

## BAY-FRIENDLY at a GLANCE

### CONSERVE ENERGY

- Deciduous trees planted to shade south-to-southwest sides of building
- More than 50% of landscape products specified come from within 150 miles of site

### PROTECT WATER & AIR QUALITY

- Synthetic pesticides prohibited during installation and maintenance; corn gluten pre-emergent herbicide and other natural pesticide alternatives used
- Stormwater runoff directed to streetside bioswales to naturally filter and percolate rainwater into the water table; hardscape (except driveway) drains to landscaped areas

### CREATE WILDLIFE HABITAT

- No synthetic pesticides used

areas with raised beds have been preplanted with cabbage, kale, broccoli, cauliflower and artichokes to inspire residents to grow their own vegetables. PGAdesign carried the theme of an edible garden into other areas of the landscape, with pineapple guava trees (*Feijoa sellowiana*) and strawberry trees (*Arbutus unedo Compacta*) at street level and lemon trees in the courtyard. One of BRIDGE Housing's service partners provides nutrition education for the residents and will help them make the link between community gardens and good health, said BRIDGE's Julia Anderson.

## PROTECTING WATER QUALITY

Rainwater running off of buildings, landscapes and streets can pick up contaminants such as pesticides and road oil and carry them into storm drains. This polluted runoff can eventually wind up in local waterways. To help protect the nearby San Francisco Bay, Ironhorse's design process "started with asking, how do we deal with stormwater and where are we going to put it?" said Freedberg. Although the building's footprint takes up most of the parcel, PGAdesign was able to create long, narrow bioswales on two sides of the property. During construction of the bioswales, existing contaminated soil was removed and replaced with "a special soil mix that allows water to flow through at a certain rate and be cleaned," said Freedberg. The bioswales were lined with plants that can survive occasional inundations of water, such as Cape rush (*Chondropetalum tectorum*) and Berkeley sedge (*Carex tumulicola*). At least 85 percent of the rainwater that falls on the roofs and courtyard is directed to these shallow open channels. The rainwater runoff then seeps into the swales, where it is filtered by the soil before flowing to storm drains.



PHOTOGRAPH BY KEVIN WOOD, SHAW DAVIS + PARTNERS, 2010

