Integrating Sustainable Design into Affordable Housing

March 2, 2010

David Brint
Brinshore Development
224-927-5052
DavidB@Brinshore.com
www.Brinshore.com
Brinshore Development

- Established in 1994
- Over $1 billion of development
- Affordable housing focus
- Sustainable design expertise
- Historic Preservation, TOD & New Urbanism
- Development award winner
Navigating Sustainable Design Options

**Sustainable Design Priorities**
1. Energy efficiency
2. Water use reduction
3. Indoor air quality
4. Innovative technology

**First Tier**
- Highly energy efficient envelope (windows, insulation)
- Energy Star appliances & high efficiency lighting
- Low flow plumbing fixtures and dual flush lavs
- Low VOC paints and stains

**Second Tier**
- Geothermal heating and cooling
- Solar thermal domestic hot water
- Permeable pavers and photocatalytic cement

**Third Tier**
- Photovoltaic panels
- Wind turbines
- Green roofs
Geothermal Heating and Cooling

Geothermal Benefits

• Extremely low-emission system
• Lowers operating costs (40% to 75% annually)

Geothermal: How it works

• Constant temperatures below the earth's surface
• Water-based fluid circulates through closed vertical loop of buried high-density polyethylene pipe
• Fluid absorbs the earth’s thermal energy and is pumped past a heat exchanger
• Heat exchanger uses a refrigerant to extract the heat and to warm coils
• A conventional forced air system blows air past the coils which distributes the conditioned air throughout the home
• Process is reversed in the summer for cooling
Tangarie Wind Turbine

Wind Turbine: Benefits

• Fiberglass vertical axis design
• Starts generating electricity at 4 mph
• Silent and bird-friendly
• Safe for urban rooftop installation
• Durable with sealed gearbox and fixed blades
• Inverter converts electricity into line voltage
• 1kw, 5kw, and 10kw units available
• Attractive design

Tangarie 10kw Wind Turbine Installation
Ann Arbor, MI
Conventional Pavement vs. Permeable Pavers

Rainwater washes pollutants into storm sewer
Impervious pavement
Polluted stormwater flows to Lake Michigan

Permeable pavement
Gravel layers to filter rainwater
Soil
Surface Pollutants

Infiltration of rainwater
Allows evaporation
Filtered rainwater flows to Lake Michigan and ravines
Absorption of filtered rainwater into soil
TX Active Photocatalytic Cement

Hyacinth Place was the first development in the United States to use innovative permeable pavers made from TX Active photocatalytic cement.

TIME's Best Inventions of 2008

Smog-Eating Cement
Cement chemical composition is enhanced with a TX Active titanium dioxide catalyst.

When exposed to sunlight or ultraviolet light, cement surfaces containing TX Active are activated and oxidize pollutants responsible for smog and acid rain.

Nitrogen and sulfur oxides, for example, are transformed into nitrates or sulfates.
Featured Sustainable Design Projects

Hyacinth Place

Crystal View

Hairpin Lofts
Hyacinth Place
Hyacinth Place: LEED Gold Certification

Sustainable Design Elements:

• Geothermal heating and cooling system
• Permeable Pavers with photo catalytic concrete
• Wind turbine
• Reflective roof coating
• Highly energy efficient building envelope
• High efficiency lighting and daylighting
• EnergyStar appliances
• Low-flow plumbing fixtures
• Bamboo strand board and renewable materials
• Non-toxic paints and stains
Hyacinth Key Sustainable Design Elements

- **Geothermal Loop**
  - Diagram showing a geothermal loop system, including ground temperature, fluid flow, and distribution to a building.
  - Text: Water-based fluid pumped through closed well-ground loop absorbs or dissipates heat from/to earth depending on the season.

- **Wind Turbine**
  - Image of a wind turbine.
  - Text: Geothermal heat exchanger transfers heat energy between the buried pipe and air handling unit. Warm air distributed to home and cool air return.

- **Photocatalytic Permeable Pavers**
  - Image of permeable pavers.
  - Text:
Crystal View
Sustainable Design Elements

- Geothermal heating and cooling system
- Building Integrated Photovoltaic Panels (BIPV)
- Highly energy efficient building envelope
- EnergyStar appliances
- Low-flow fixtures & dual flush lavs
- High efficiency lighting, daylighting and Solatubes
- Ceiling fans & programmable thermostats
- Renewable materials, non-toxic paints & stains
- Rain gardens, bio-swales, & native landscaping
- Bike parking
Crystal View Key Sustainable Design Elements

Geothermal Loop

Photovoltaic Panels

Bioswales
Crystal View Site Plan

- Rain Garden
- Bioswales
- Central Bioswales
- Building Integrated Photovoltaic panels
- Geothermal Wells (x144)
Hairpin Lofts and Logan Square Art Center

Image from the Collection of the Chicago History Museum
Sustainable Design Elements

• Solar thermal rooftop panels for domestic hot water
• Geothermal heating and cooling system
• Photocatalytic rooftop patio pavers
• Green roof and reflective roof coating
• Highly energy efficient building envelope
• High efficiency lighting and daylighting
• EnergyStar appliances
• Low-flow plumbing fixtures
• Non-toxic paints, stains, finish materials
• Transit oriented design with I-Go Car share location & bike storage/maintenance room
Hairpin Lofts Sustainable Design Elements

- Solar Thermal Rooftop Panels
- Geothermal Loop
- Photocatalytic Rooftop Patio Pavers
Hairpin Lofts Site Plan

- Geothermal Wells (x14)
- Photocatalytic Rooftop Pavers
- Solar Thermal Panels
- Green & Reflective Roof

Logan Square Art Center and Hairpin Lofts
2800 N. Milwaukee Ave, Chicago, IL

Scale 1” = 40’-0”
Date 12.08.08