

case study:



the green building

## retrofitting a 110 year-old building



SOUTHEAST REGION

JULY 28th & 29th

workshops

speakers

exhibits

09

BIRMINGHAM, ALABAMA  
BIRMINGHAM-JEFFERSON  
CONVENTION CENTER



[www.ferstudio.com](http://www.ferstudio.com) • [www.thegreenbuilding.net](http://www.thegreenbuilding.net) • [www.greenbuildingfocus.com](http://www.greenbuildingfocus.com)

Douglas V. Pierson AIA LEED AP    Christopher Mercier AIA  
Partners / Design Principals

(fer) studio

architecture • interiors • sustainability

Wednesday July 29, 2009 1:30 p.m.

**Owner**  
Augusta and Gill Holland of The Green Building  
732 East Market Street, Louisville, KY 40202  
[www.thegreenbuilding.com](http://www.thegreenbuilding.com)

**The Green Building**  
Stephanie Brothers  
Amber Garvey

**Architect/LEED Coordinator**  
(fer) studio, LLP  
Douglas Pierson and Chris Mercier, design principals

Design Team  
Darren Chen, Clemente Macias, Robert Mothershed, Anthony Priest, David Turner, Kuniko Nickel, Matt McGrane  
[www.ferstudio.com](http://www.ferstudio.com)

**Construction Manager**  
Tim Peters of TC Peters Construction  
[www.tcpeters.com](http://www.tcpeters.com)

**Structural Engineer**  
Brett Davis of BTM Engineering  
[www.btmeng.com](http://www.btmeng.com)

**Photovoltaics/ Geothermal/ Energy Storage and Mechanical**  
David Gabhart of Solar Designs Inc.  
[www.solar-designs-inc.com](http://www.solar-designs-inc.com)

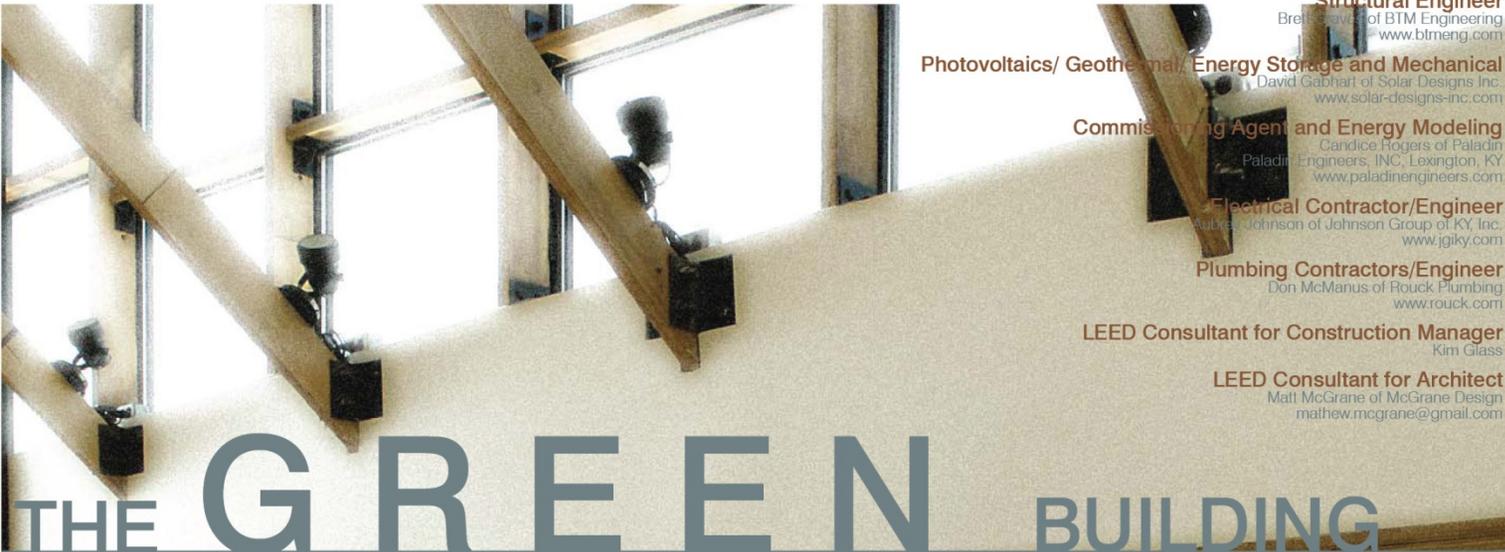
**Commissioning Agent and Energy Modeling**  
Candice Rogers of Paladin  
Paladin Engineers, INC, Lexington, KY  
[www.paladinengineers.com](http://www.paladinengineers.com)

**Electrical Contractor/Engineer**  
Aubrey Johnson of Johnson Group of KY, Inc.  
[www.jgiky.com](http://www.jgiky.com)

**Plumbing Contractors/Engineer**  
Don McManus of Rouck Plumbing  
[www.rouck.com](http://www.rouck.com)

**LEED Consultant for Construction Manager**  
Kim Glass

**LEED Consultant for Architect**  
Matt McGrane of McGrane Design  
[mathew.mcgrane@gmail.com](mailto:mathew.mcgrane@gmail.com)



# THE GREEN BUILDING

732 E. MARKET ST.

**Lighting Consultant**  
Gary Jakoby of LHI Lighting Sales, Inc.

**Superintendent**  
Richard Pickard of Union Square, Louisville, KY

**Photography**  
Ted Walthan / Quadrant Studios  
Douglas Pierson, (fer) studio  
Ted Walthan, Quadrant Studios  
Chris Faulhammer, (fer) studio  
Richard Pickard, Union Square  
Sarah Lyons

**Renderings**  
David Turner and Robert Mothershed, (fer) studio

**Curtain Walls**  
Kawneer  
<http://www.kawneer.com>

**Siding**  
Cement Board Fabricators, Louisville, KY  
<http://www.cbf11.com>

**Reclaimed Floors**  
TC Peters Construction, Louisville KY

**Millwork/Casework**  
Kentucky Millwork  
<http://www.kentuckymill.com>

**Concrete**  
Euton Concrete, New Albany, Indiana  
Masonry with Fly Ash and Slag  
Masonomics, Louisville, KY



(fer)studio

1. STUDIO PROFILE



3. RESTORE & RE-USE



5. NEW SYSTEMS & ASSEMBLIES



4. SHARED SPACES  
NATURAL LIGHT



6. CONTEMPORARY DESIGN



2. SITE & CONTEXT



CASE STUDY: THE GREEN BUILDING

(fer)studio

(fer)studio

1. STUDIO PROFILE



(fer)studio

1. STUDIO PROFILE



SUSTAINABILITY

RESIDENTIAL

INTERIORS

ARCHITECTURE



(fer)<sub>studio</sub>

1. STUDIO PROFILE



HOSPITALITY

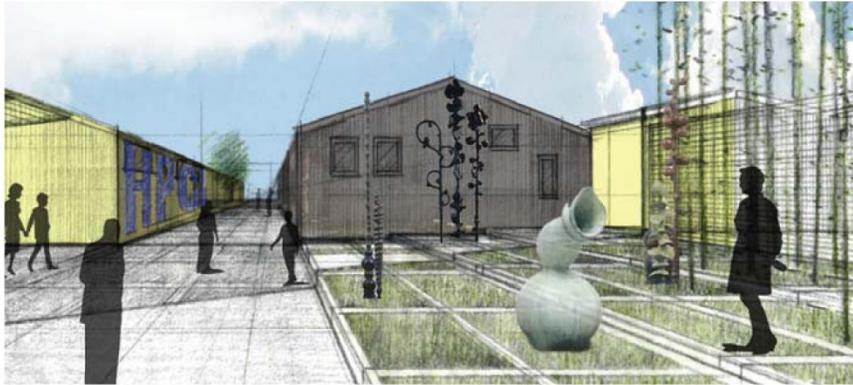
EDUCATION

RESIDENTIAL

MASTERPLANNING



1. STUDIO PROFILE



SUSTAINABILITY

MASTERPLANNING

INTERIORS

ARCHITECTURE



1. STUDIO PROFILE



HOSPITALITY

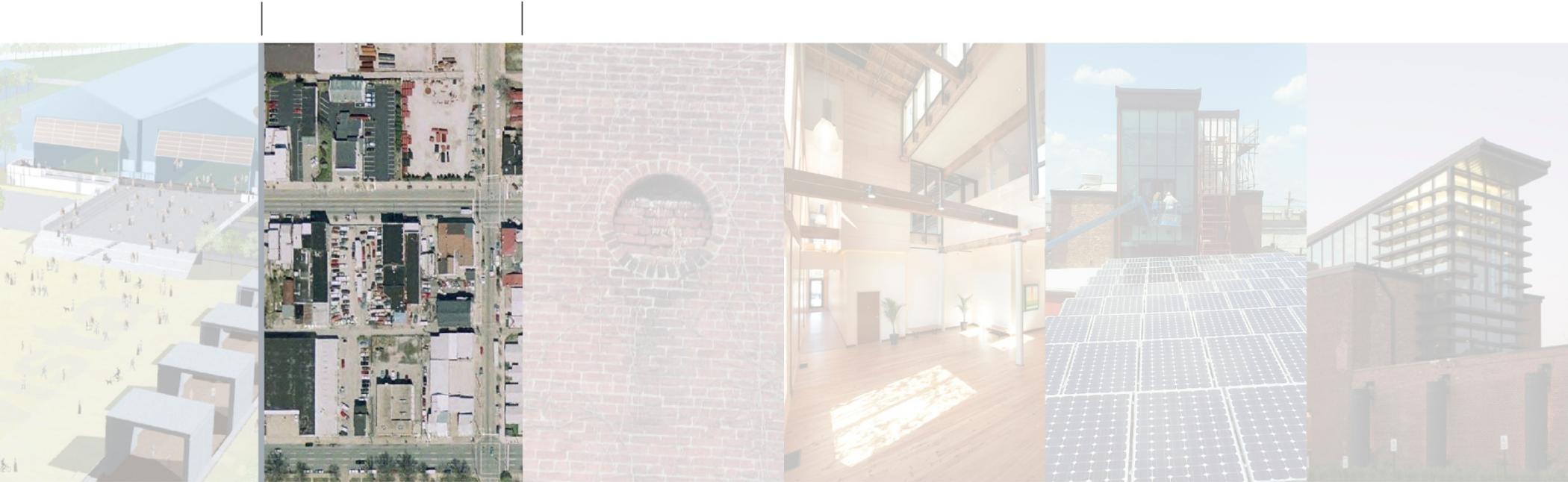
EDUCATION

RESIDENTIAL

MASTERPLANNING

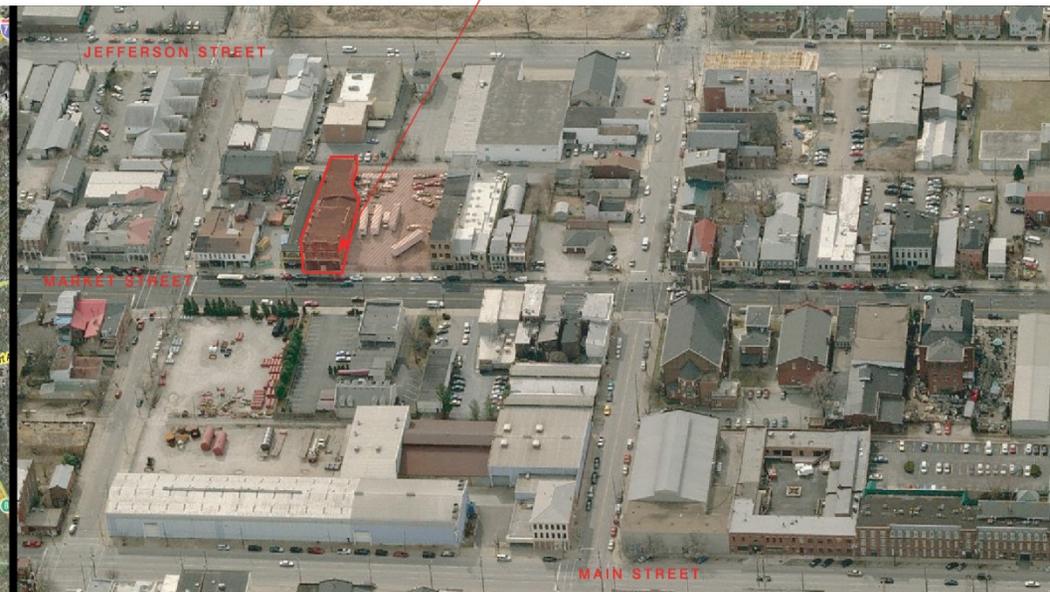
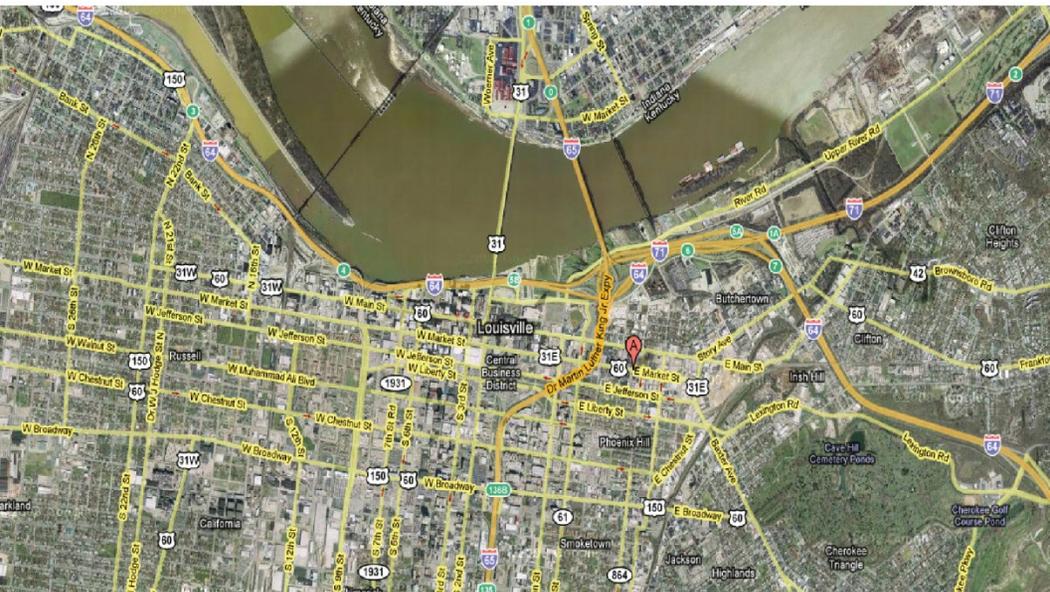


(fer)<sub>studio</sub>



2. SITE & CONTEXT

CASE STUDY: THE GREEN BUILDING



732 E Market Street

2. SITE & CONTEXT

City of Louisville

East Market neighborhood





2. SITE & CONTEXT

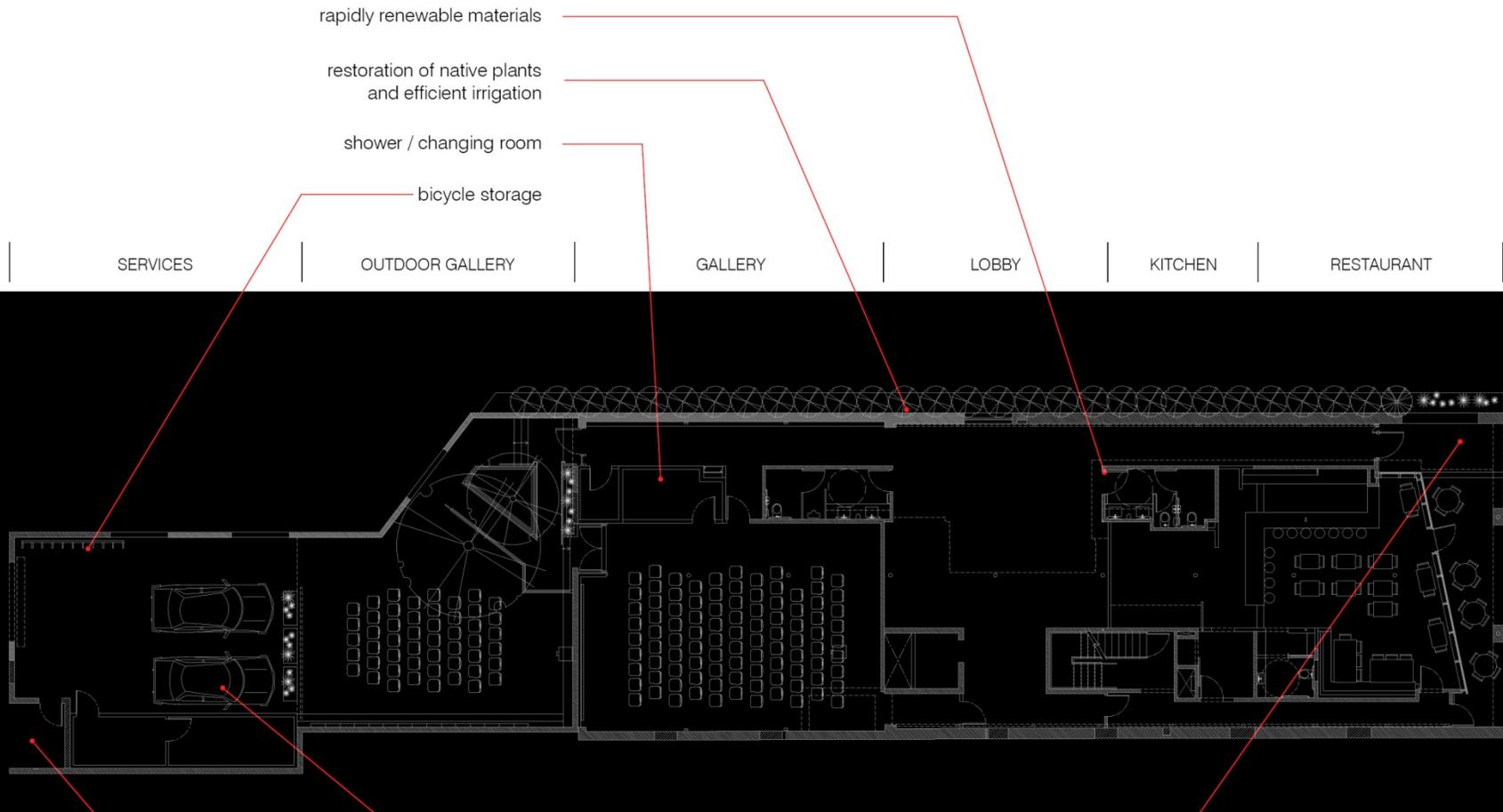
The Green Building prior to renovation



2. SITE & CONTEXT



2. SITE & CONTEXT



**2. SITE & CONTEXT**

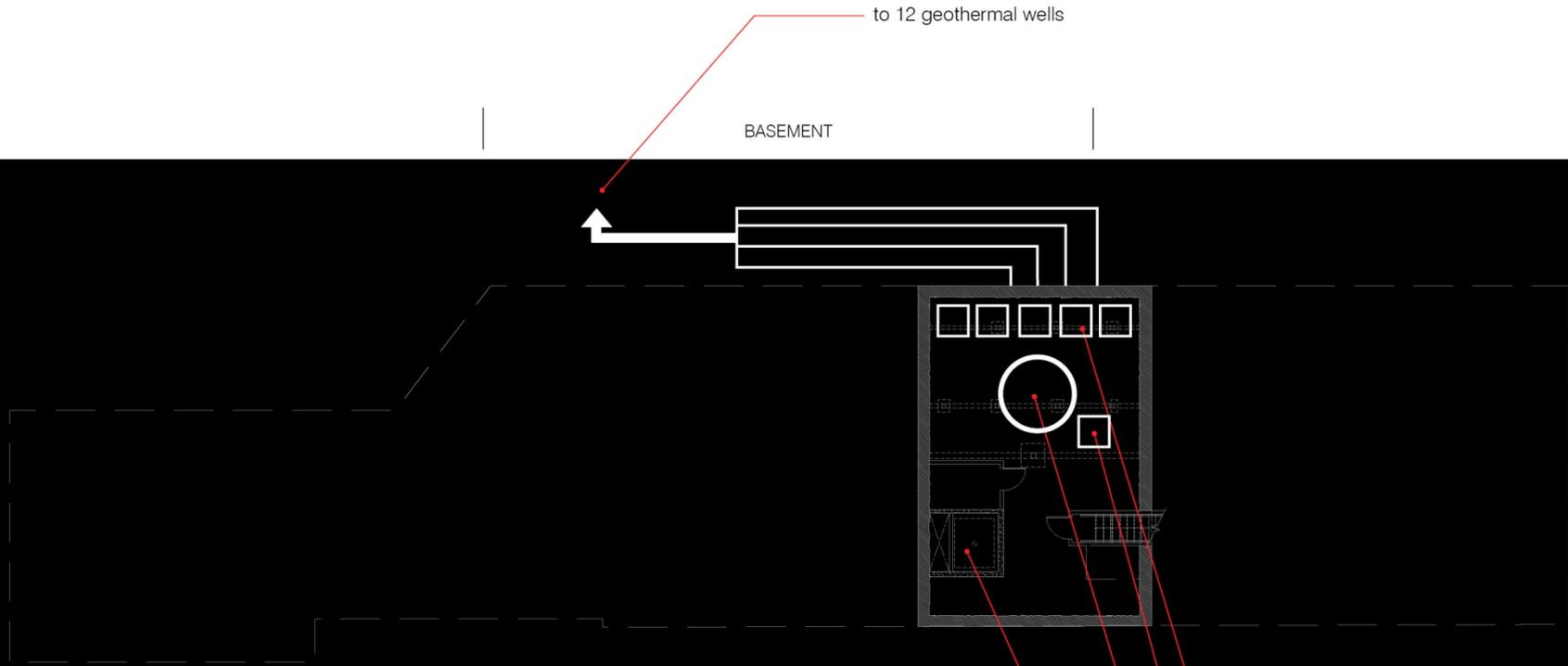
low emitting & fuel efficient vehicle parking

recycling storage & cooling center

maximize open space and introduce vegetation

first floor plan





2. SITE & CONTEXT

basement floor plan

geothermal heat pumps

heat exchanger

energy storage

elevator shaft & equipment room



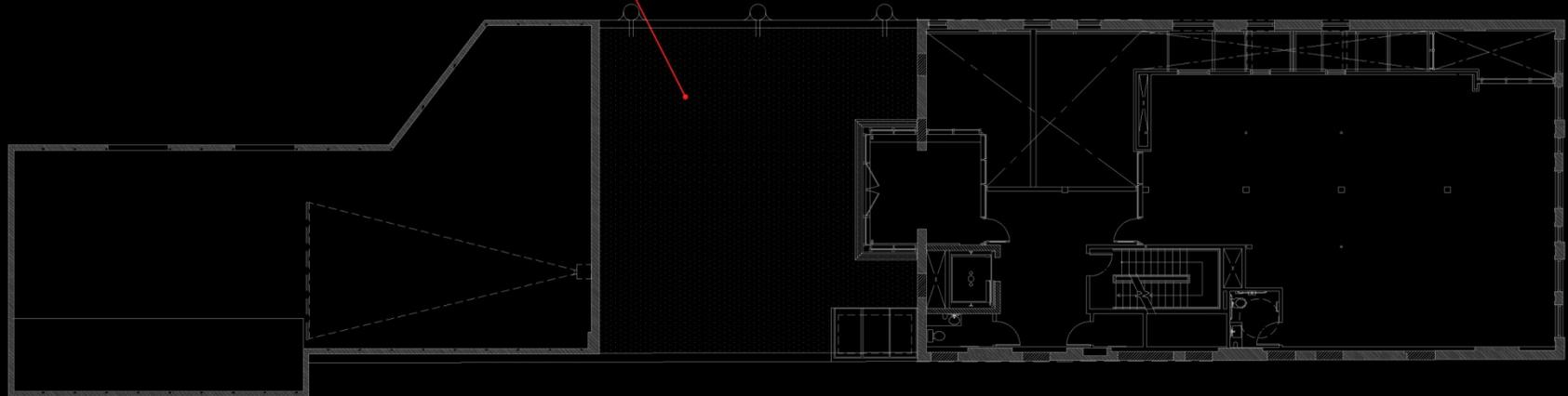
green roof / storm water retention

GREEN ROOF

CONF.

LOBBY

OFFICE



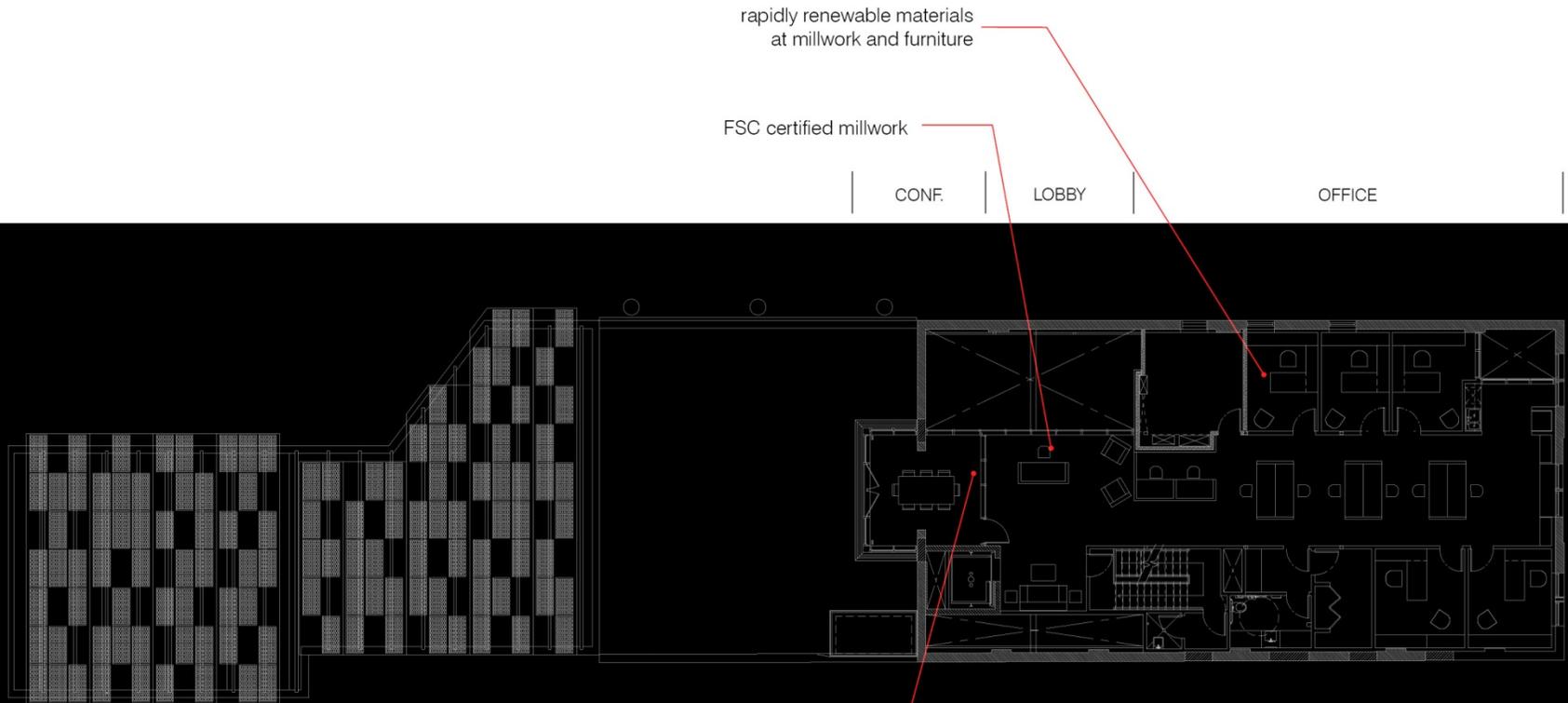
2. SITE & CONTEXT

second floor plan



N

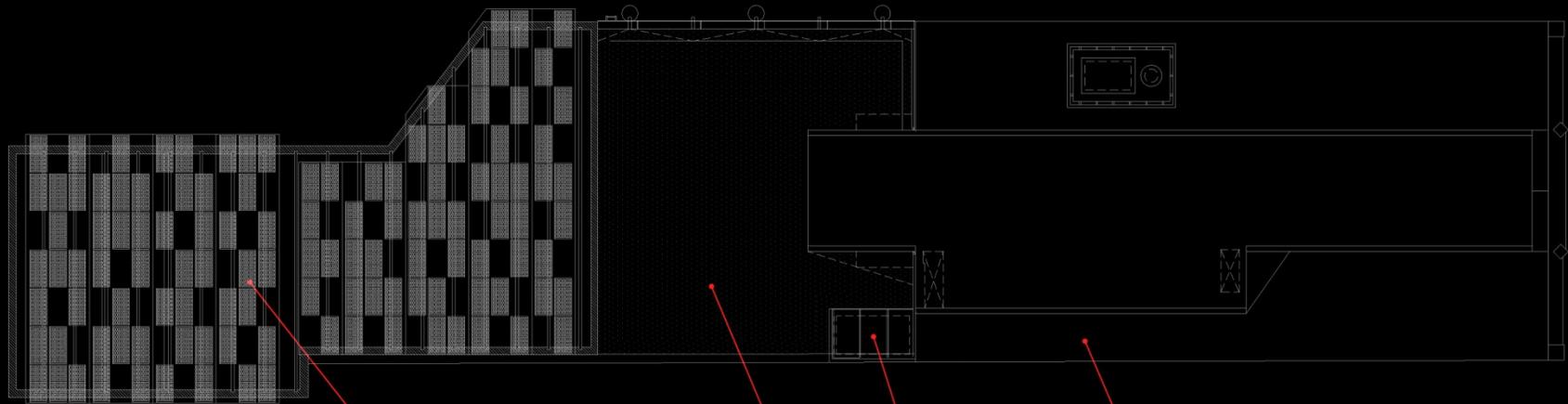
(fer)studio



PHOTOVOLTAIC ROOF

LOW GREEN ROOF

HIGH ROOF



2. SITE & CONTEXT

cool roof  
(SRI: solar reference index > 78)

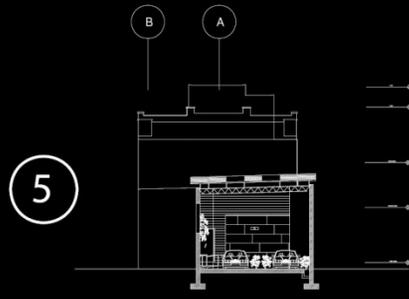
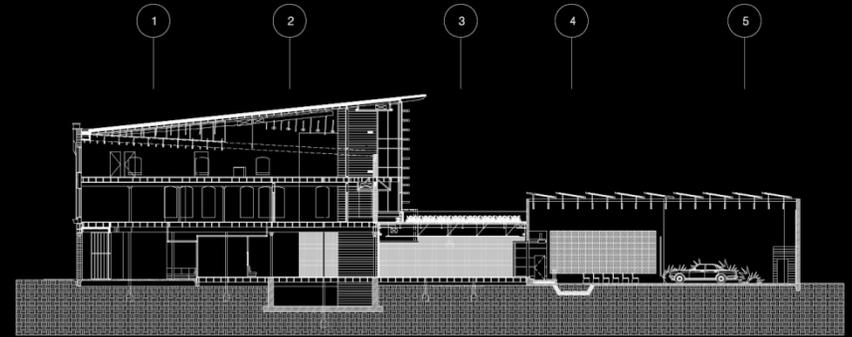
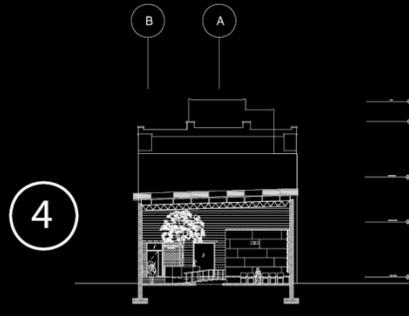
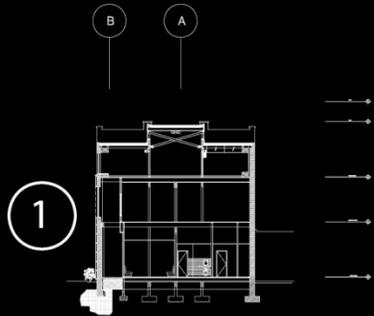
roof plan

skylights

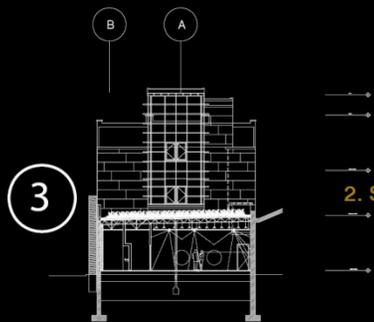
extensive green roof

photovoltaic panels

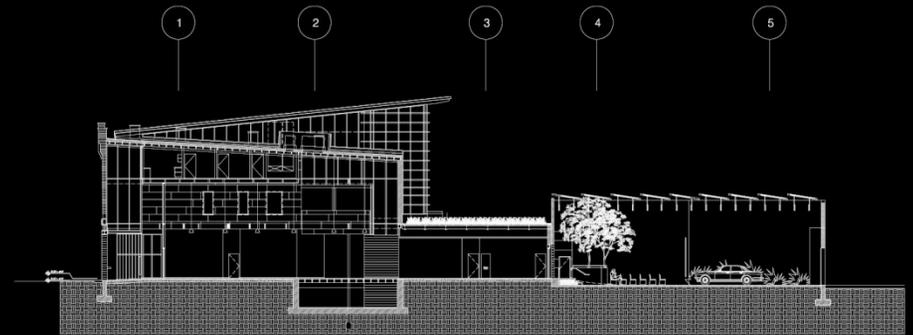




A



2. SITE & CONTEXT



B



2. SITE & CONTEXT

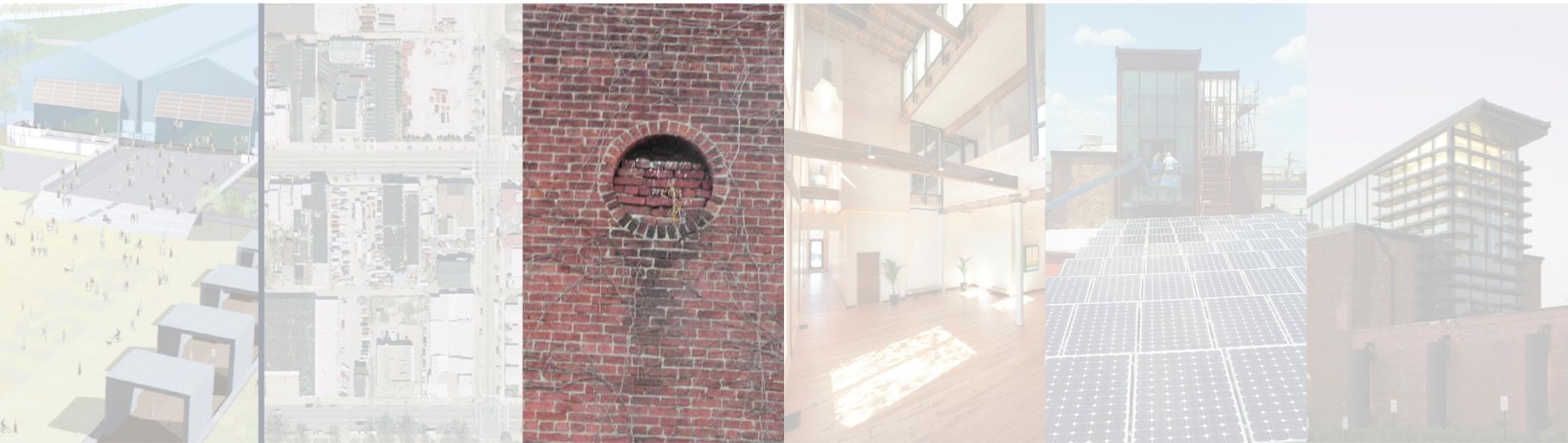


2. SITE & CONTEXT

RAIN GARDEN

ALLEY

3. RESTORE & RE-USE



CASE STUDY: THE GREEN BUILDING

3. RESTORE & RE-USE



3. RESTORE & RE-USE



3. RESTORE & RE-USE



north elevation

increase public space by  
recessing facade

3. RESTORE & RE-USE



3. RESTORE & RE-USE



3. RESTORE & RE-USE



3. RESTORE & RE-USE



3. RESTORE & RE-USE



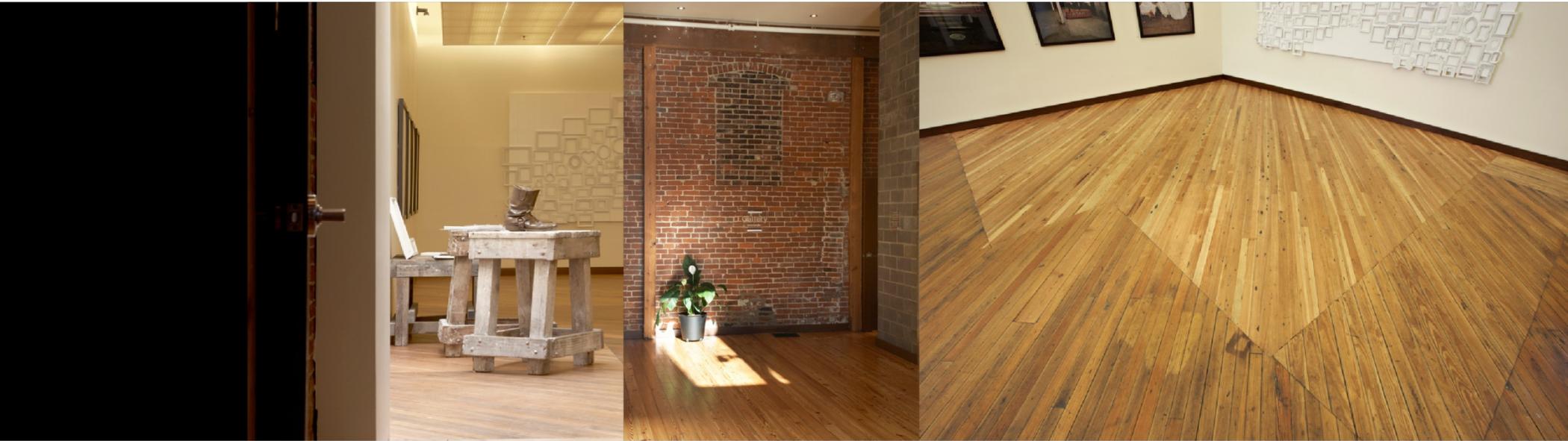
3. RESTORE & RE-USE



3. RESTORE & RE-USE



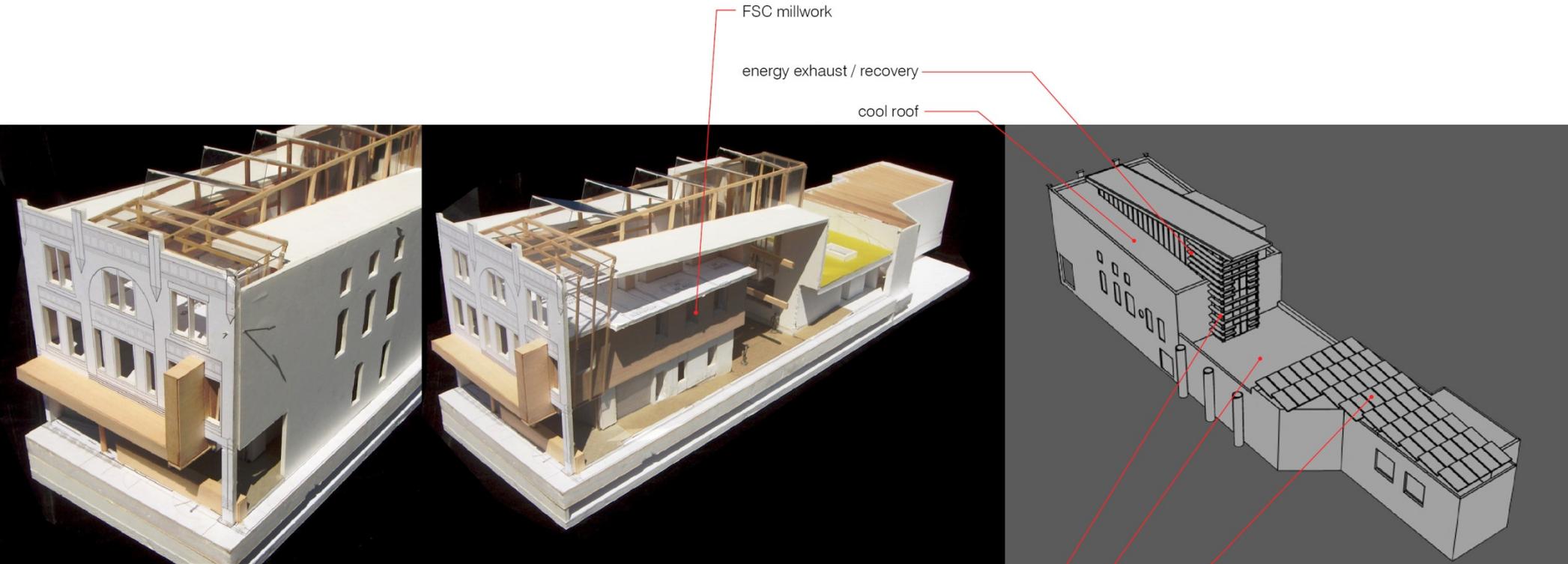
3. RESTORE & RE-USE





4. SHARED SPACES  
NATURAL LIGHT

CASE STUDY: THE GREEN BUILDING



4. SHARED SPACES  
NATURAL LIGHT

conference room encloses at  
cascading glazing

green roof

courtyard w/ photovoltaics



THE GREEN BUILDING

SOCIAL

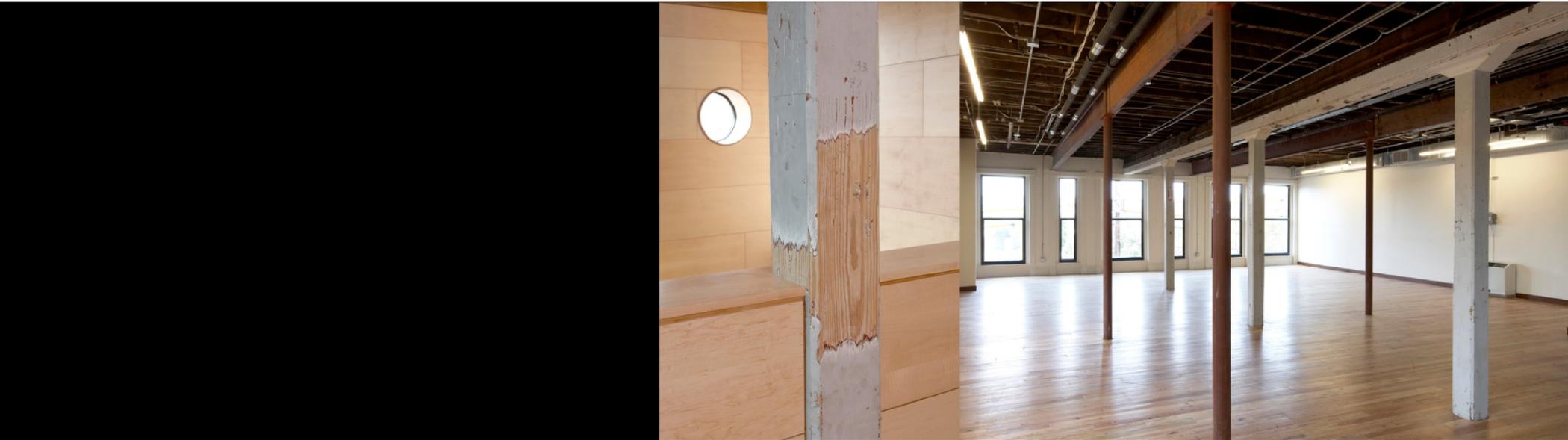
OPEN

4 SHARED SPACES  
NATURAL LIGHT



4. SHARED SPACES  
NATURAL LIGHT





4. SHARED SPACES  
NATURAL LIGHT

4. SHARED SPACES  
NATURAL LIGHT

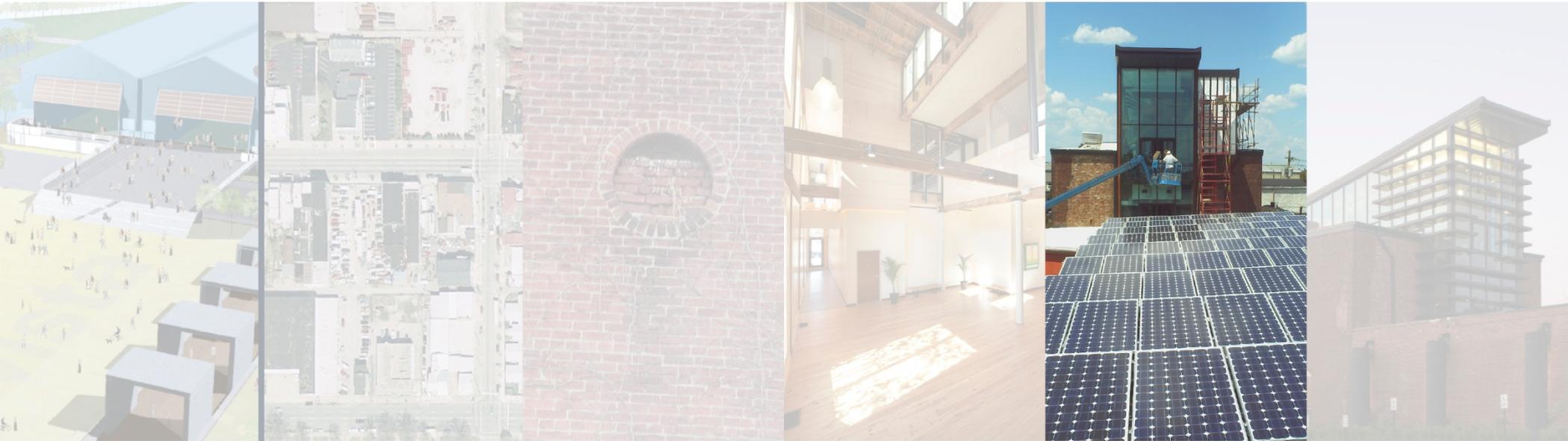


4. SHARED SPACES  
NATURAL LIGHT



4. SHARED SPACES  
NATURAL LIGHT

5. NEW SYSTEMS  
& ASSEMBLIES



CASE STUDY: THE GREEN BUILDING

5. NEW SYSTEMS  
& ASSEMBLIES

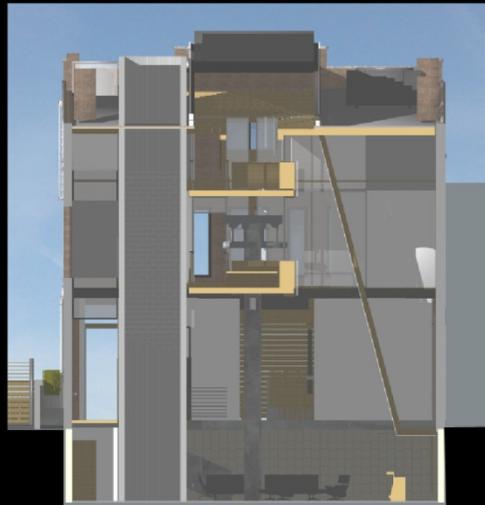


BACK

MIDDLE

5. NEW SYSTEMS  
& ASSEMBLIES

FRONT



indoor environmental  
quality

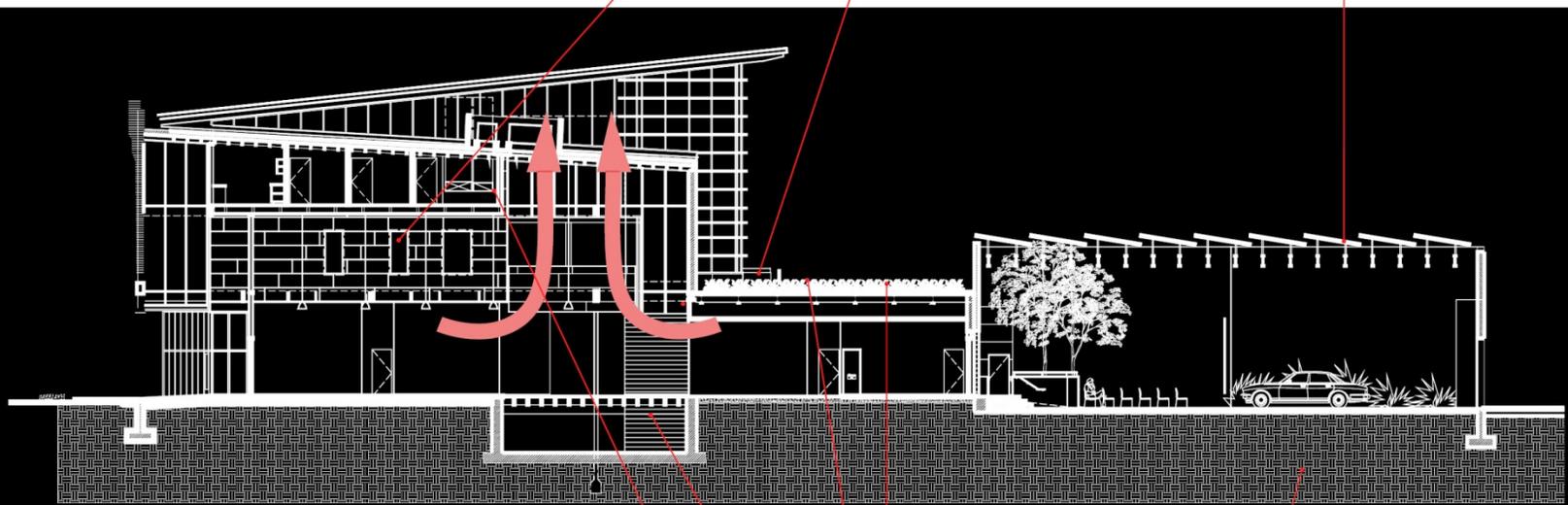
eco-friendly  
materials

view tunnels for improved daylighting and views

skylights at surrounded spaces

solar panels

5. NEW SYSTEMS  
& ASSEMBLIES



optimize energy performance  
on site / offsite renewable  
energy

steel framing w/ 70% recycled  
content

closed loop geothermal well

green roof

thermal energy storage

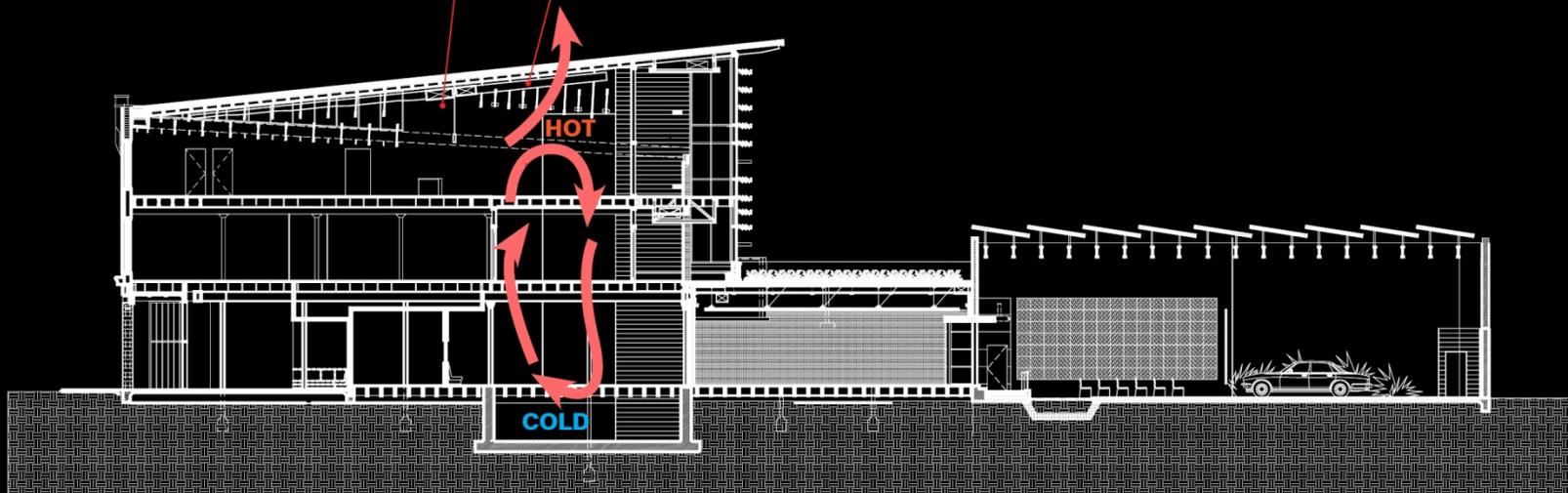
energy recovery ventilation

section 2

added height to third floor office spaces,  
improved daylighting & views,  
increased ventilation

triple height lobby, re-distributes  
hot & cold air throughout building  
via energy recovery ventilation

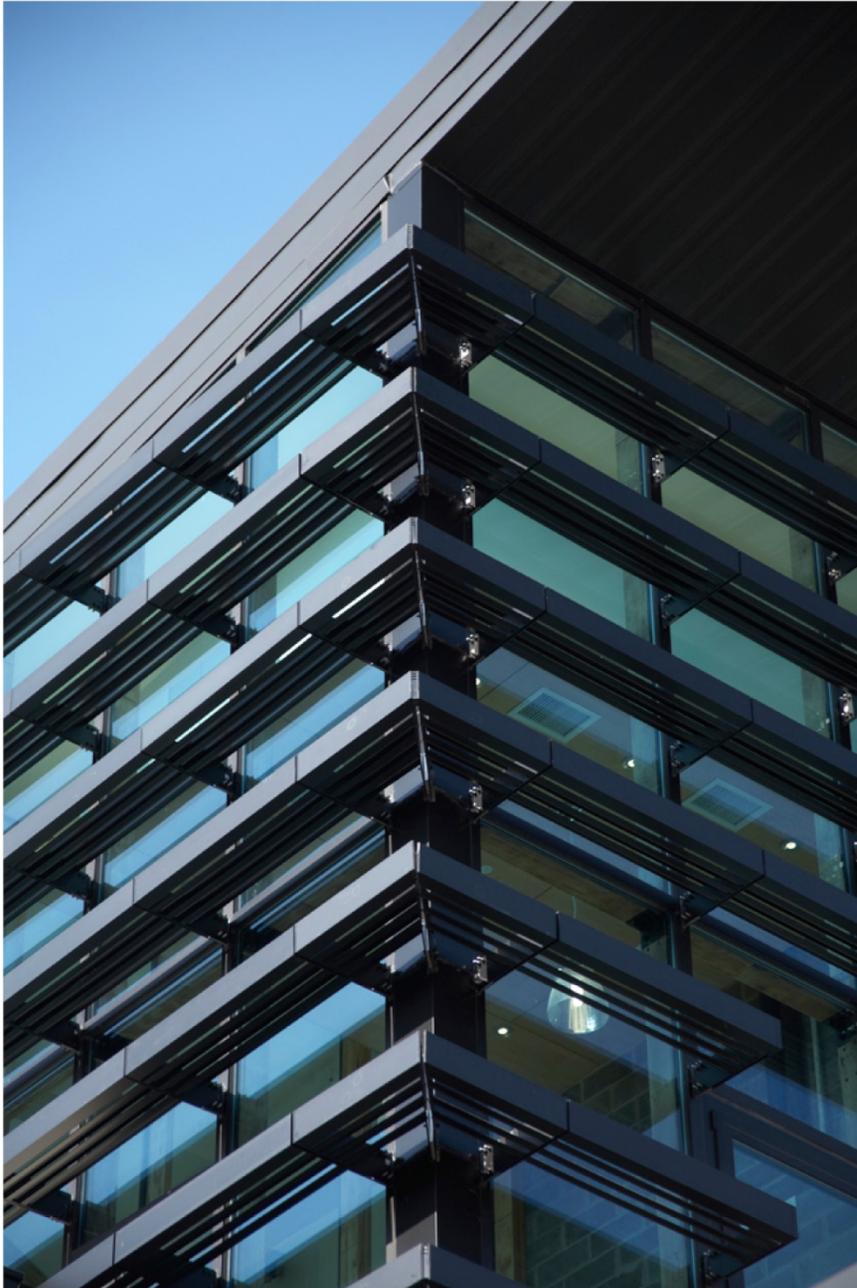
### 5. NEW SYSTEMS & ASSEMBLIES



section 1

#### SUSTAINABLE SYSTEMS

- Geothermal Heat Exchange
- Cooling system - ice storage in basement
- Energy Recovery ventilation
- Photovoltaic panels
- Automated Building System
- Daylight Harvesting & Motion Sensor Control
- Energy Efficient Light fixtures
- Radiant Floor Heating



5. NEW SYSTEMS  
& ASSEMBLIES

5. NEW SYSTEMS  
& ASSEMBLIES

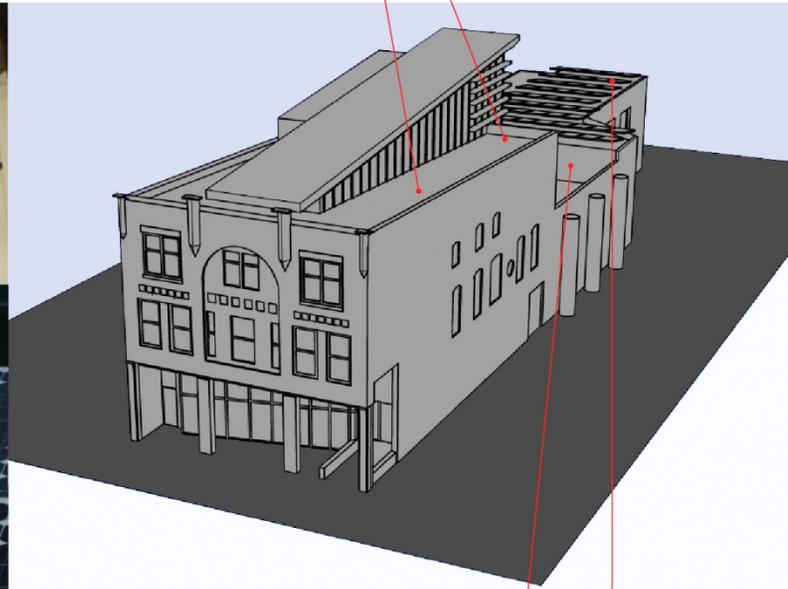


re-used wood framing in lobby

chimney ventilation system

cool roof

5. NEW SYSTEMS  
& ASSEMBLIES



green roof

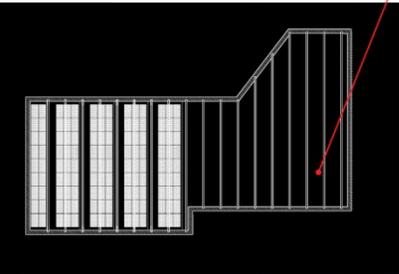
courtyard w/ photovoltaics

exposed existing trusses support  
new photovoltaic outdoor canopy

green roof construction & plantings

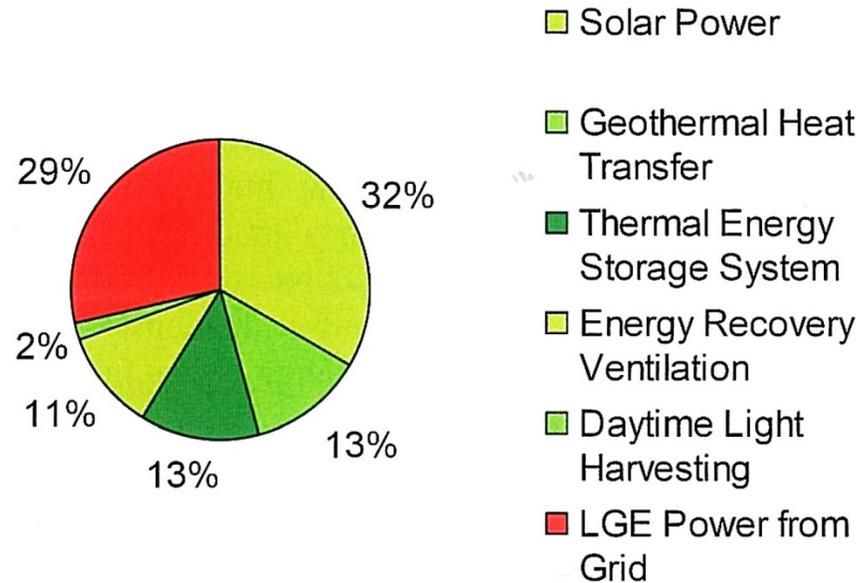
exterior louvers minimize  
radiant heat gain

5. NEW SYSTEMS  
& ASSEMBLIES



roof

view from garden roof



## THE GREEN BUILDING ([www.greenbuilding.net](http://www.greenbuilding.net)) ENERGY EFFICIENCY CHART

- **Size of project: 15, 400 SF.**
- **Building efficiency: 68%**

\* Based on ASHRAE 90.7 typical energy use for type & size of building



5. NEW SYSTEMS  
& ASSEMBLIES

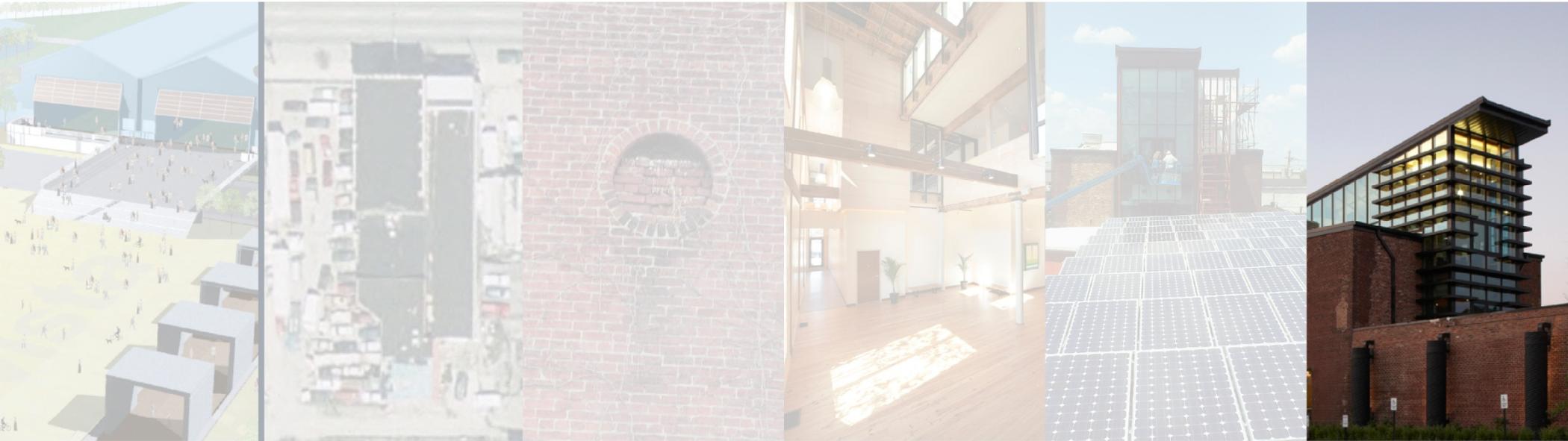
5. NEW SYSTEMS  
& ASSEMBLIES



5. NEW SYSTEMS  
& ASSEMBLIES



5. NEW SYSTEMS  
& ASSEMBLIES



CASE STUDY: THE GREEN BUILDING

6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN



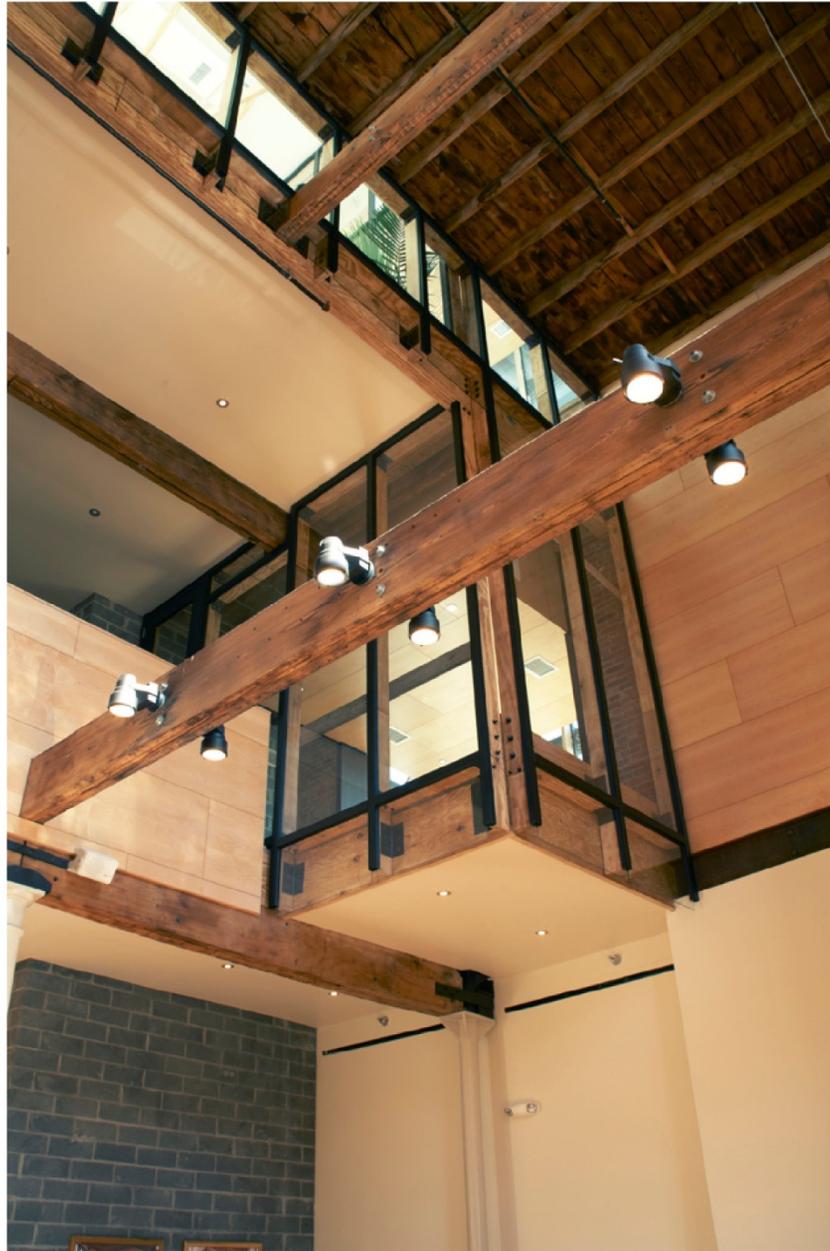
6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN



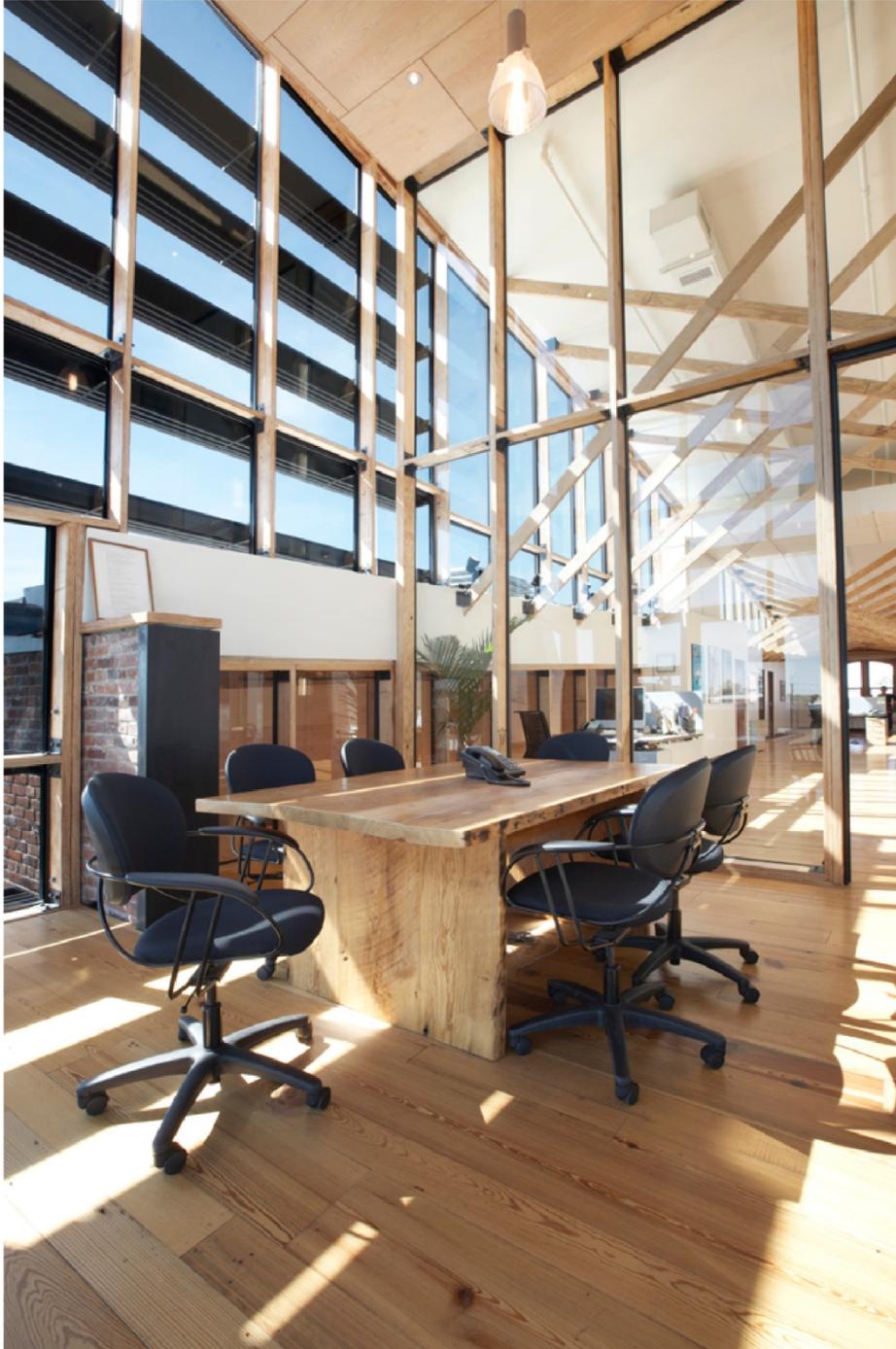
6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN



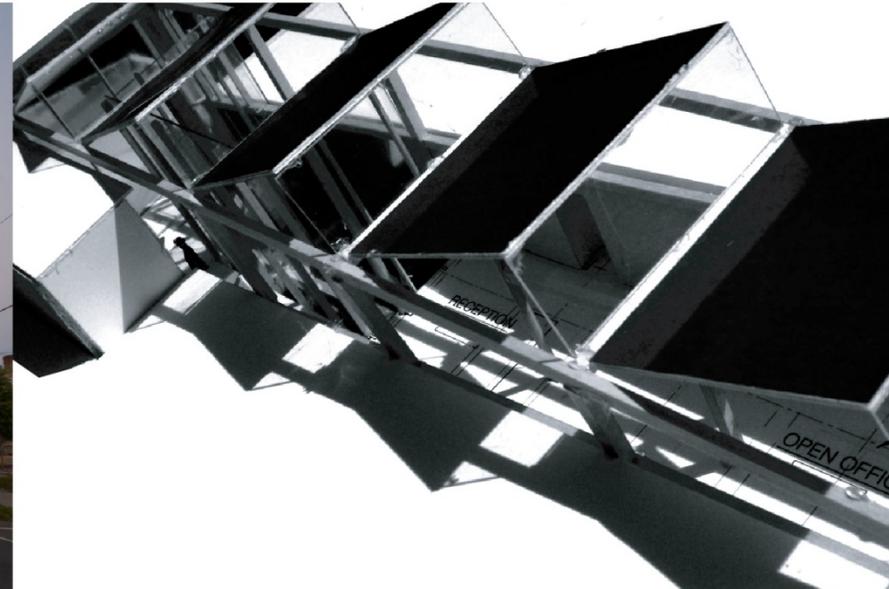
6. CONTEMPORARY DESIGN



6. CONTEMPORARY DESIGN

## sustainable features

Construction Activity Pollution Prevention & Waste Management  
 Site Selection  
 Development Density & Community Connectivity  
 Alternative Transportation: Public Transportation Access  
 Site Development: Restore & Protect Habitat  
 Site Development: Maximize Open Space  
 Site Development: Stormwater Management  
 Urban Heat Island Reduction (Site and Roof)  
 Substantial Water Use Reduction  
 Optimal Building Energy Performance  
 Refrigerant Management



6. CONTEMPORARY DESIGN

Substantial Water Use Reduction  
 65% Energy Efficiency  
 Refrigerant Management  
 Green Power  
 Recycling Program  
 Building Re-Use of Materials  
 Recycled Content In Materials  
 Regional Materials  
 Certified Wood  
 Indoor Air Quality Control  
 Geothermal Heating and Cooling  
 Specified Low-Emitting Materials  
 Efficient Occupant Light and Thermal Comfort Control Systems  
 Improved Daylighting and Views  
 Radiant Floor Heating  
 Photovoltaic Energy  
 Energy Recovery Ventilator