



# Sustainability and Historic Preservation Lessons learned

February 26, 2007



# Lesson Learned; You don't have to replace historic Materials and features to gain a LEED rating



Historic Buildings have many inherent energy-saving features that can be used to reduce energy consumption



# What are the Principles of Sustainability?

(adapted from the Whole Building Design Guide)

1. Optimize Site Potential
2. Minimize Energy Consumption
3. Protect and Preserve Water
4. Use Environmentally Preferable Products
5. Enhance Indoor Environmental Quality
6. Optimize Operational & Maintenance Practices

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# What are some of the lessons learned about retrofitting historic buildings to enhance the sustainability quotient?

Windows don't always need to be replaced

There are many operations and management techniques that do not require removal of historic features

Many small changes can add to big results in reducing water and energy usage

There are interesting new products on the market such as Photovoltaic and alternative power sources

# Main Interior Building's LEED for Existing Building Pilot Project

**Historic Buildings can be made LEED certified and all buildings can be made more sustainable by following good principles of Sustainability;**

**The Silver Rating achieved in the first phase of Rehabilitation did not destroy any historic features or character.**



**1849 C Street, NW Washington DC; Silver  
LEED EB**



# LEED\_EB 2004



Main Interior gained 41 points  
for a Silver rating for Phase 1

**Certified; 32-39 Points**

**!Silver; 40-47 points!**

**Gold; 48-63 points**

**Platinum; 64-85 points**

**The US Green Building Council**

**should be encouraged to assign LEED points ( up to 10 points)  
to preserving historic materials in place instead of recycling materials.**



Retention of existing materials is a sustainable action; cork floors, operable windows, glass doors in corridors, quality construction





## Switching to compact fluorescence bulbs in replica fixture in offices







# Use Environmentally Preferable Products



Using linoleum flooring, recycled products in cabinetry and Energy saving light fixtures makes the staff lounge at Main Interior Building part of the LEED EB pilot project



New efficient pendant lighting  
New efficient HVAC system  
Low flow water fixtures





# Optimize Operational and Maintenance Practices



Using environmentally formulated cleaning products, keeping Buildings in good operating condition, and recycling waste improves sustainability ratings of buildings



## Successful Green Design in an Industrial Setting



Fuller Paint Company, Salt Lake City, UT



Utilizing environmentally sensitive products, systems and management criteria, enhancing daylighting this Federal Tax Credit project is receiving a LEED Certified rating



Fuller Paint Co. Salt Lake City, UT



Owner retained single-glazed steel sash and was still able to get a LEED certification. Owner used underground drip irrigation in a desert environment



Fuller Paint, Salt Lake City, UT

Owner used high performance HVAC, low flow water fixtures, fluorescent lights and recycled content materials – all while retaining historic columns, concrete floors and interior fire doors – important historic features



Fuller Paint Co., Salt Lake City, UT



Using high-content recycled products, energy saving lights, Direct/Indirect HVAC, 75% waste recycling, interior glass walls for borrowed light to interior as well as new glass atrium, all contribute to the LEED Certified rating.



## Successful Green Design in a Significant Landscape Thoreau Center; Presidio of San Francisco



Exterior: photovoltaic cells over entrance, natural plantings,  
Composting, reliance on large windows to enhance natural  
lighting, cross ventilation, grey water irrigation

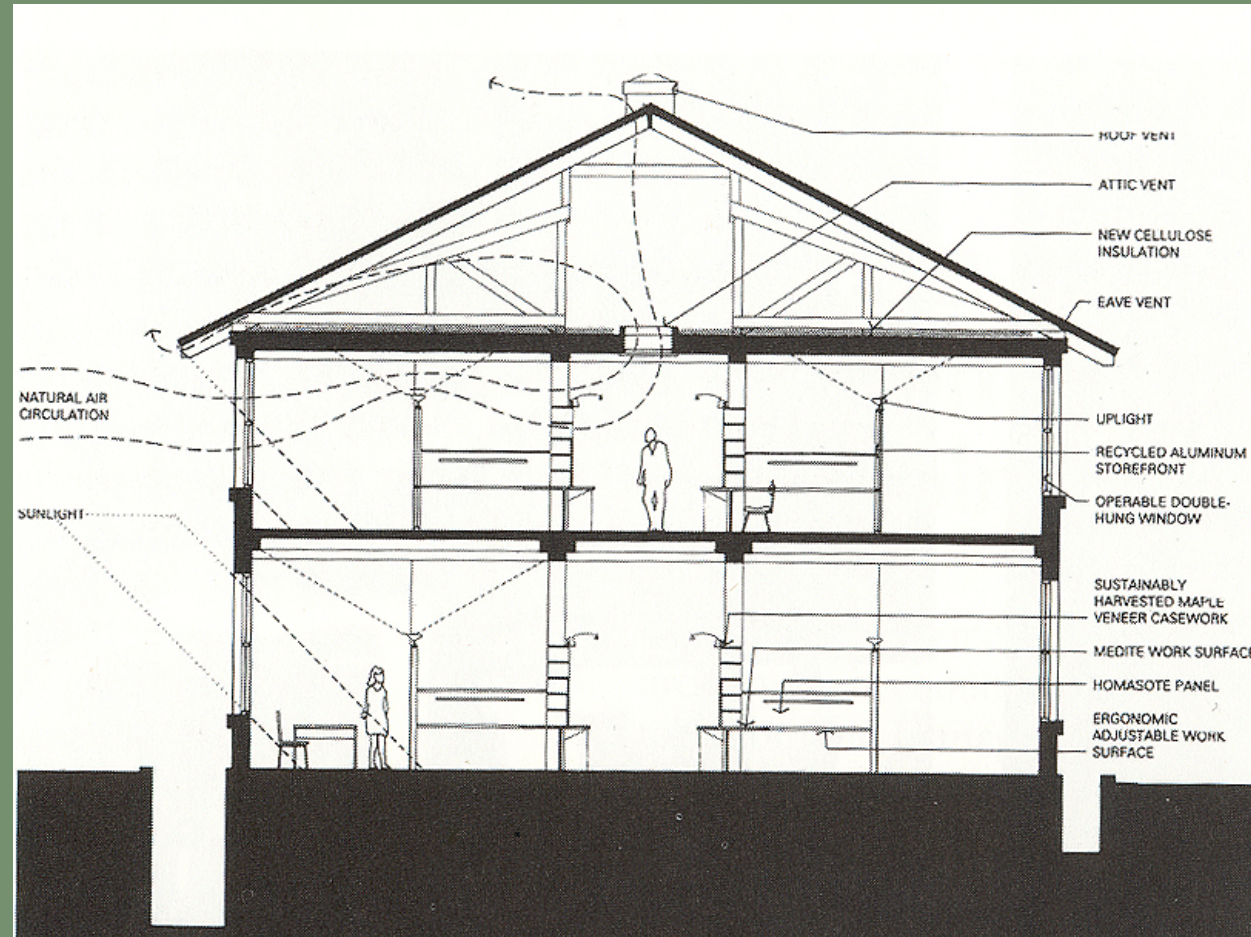




# Using the inherent design to maximize energy conservation Thoreau Center; Presidio of San Francisco



Natural Ventilation  
Daylight  
Views to exterior  
Recycled content  
Farm raised woods  
Non-voc paint  
Limited A/C



Historic hospital ward converted to offices



## Thoreau Center; Presidio of San Francisco



Interior finishes; farm raised wood furniture, recycled aluminum store front partitions with large glazing panels to maximize natural light, recycled-content acoustical tiles, carpet and cotton fiber insulation, energy efficient light fixtures, light colored walls,



## Maximize non-contributing waste as part of the recycling process



Roosevelt School, Salina, KS

Demolition of a non-contributing wing and sorting and recycling waste material gave LEED points for project converting historic school to senior housing using Federal historic tax credits. Keeping waste on site gives more credit than trucking off-site



# Enhance Indoor Environmental Quality and Reduce Energy Consumption



Operable historic windows are an asset to improve indoor air quality and can be improved to meet energy reduction measures. Older windows are renewable and repairable; many new thermal windows are not repairable and once the dual glazing seals are broken, must be totally replaced.



# Recent Study of Eastern Market, Washington, DC revealed no major benefit from replacing historic windows as part of a LEED project





# What are some of the operational techniques Used to improve the sustainability quotient of a building?

- Encourage the use of public transportation, carpools
- Provide changing rooms for bicycle riders/joggers
- Utilize electric powered vehicles
- Recycle paper content of office waste
- Recycle glass, metal, plastic products
- Program utilities to reflect office hour comfort
- Use green building cleaning products
- Use native species of plants requiring less care



# What are some of the non-invasive techniques used to improve a building's sustainability quotient?

- Retain historic materials and features

- Recycle demolition waste of non-historic materials

- Integrate new high-content recycled materials

- Improve energy efficiency of exterior envelope/windows

- Reduce water flow in bathrooms

- Use motion detectors to control lighting levels

- Change out light fixtures to compact fluorescents

- Use high efficiency HVAC systems with fan settings

- Use "grey" or rainwater for irrigation

- Consider if grass roof is appropriate



# What are the issues that are sometimes in conflict with the Secretary of the interior's Standards?

Replacing Windows without assessing their significance and ability to be upgraded

Installing inappropriate solar roofing

Insulating walls without replacing historic trim

Adding Dormers or other glazing features to enhance daylighting

Removing historic functional features, like air shafts and cupolas, that could enhance the energy performance of the building





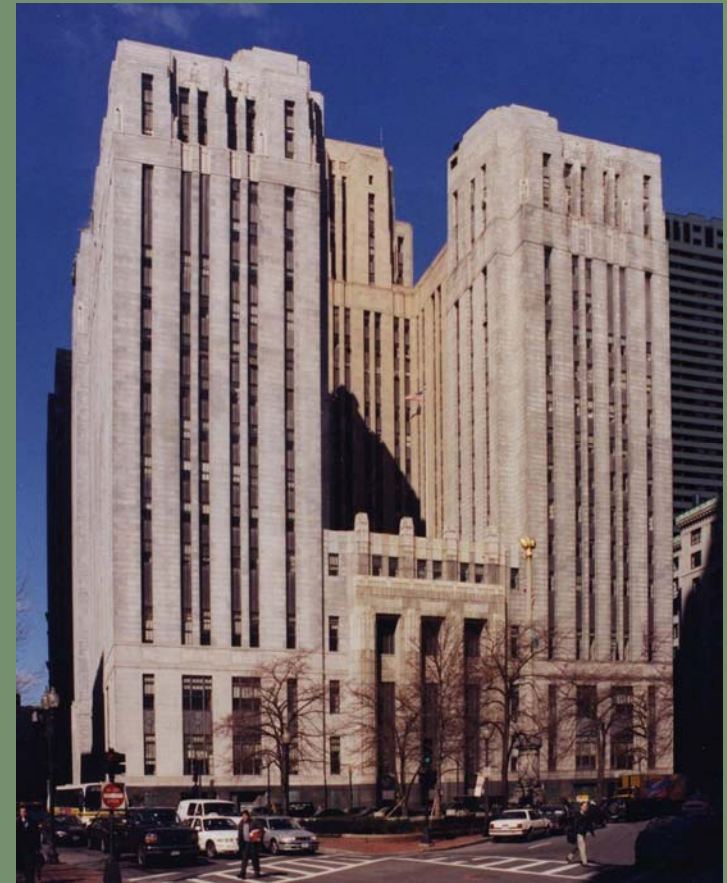
# What are some of the more complex means of enhancing the sustainability quotient?

Geothermal wells

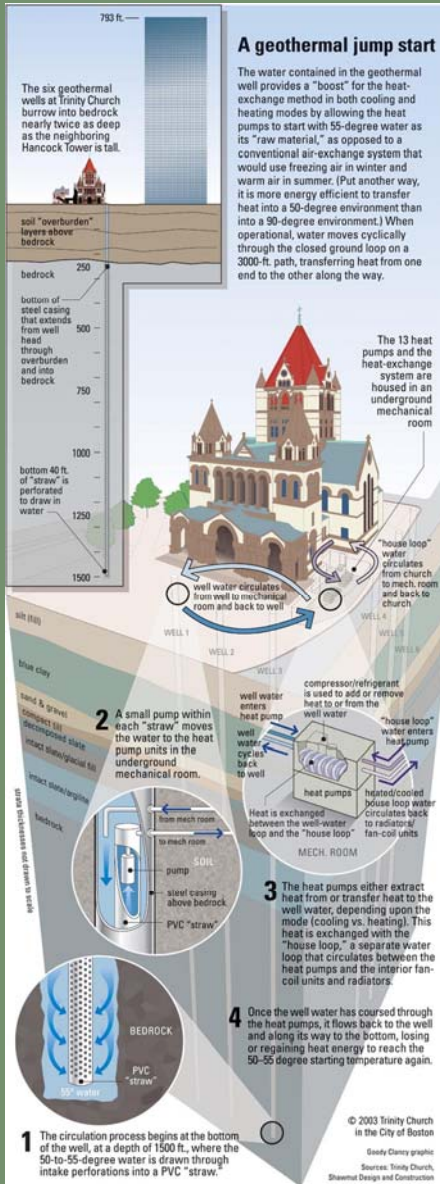
Grass roof gardens

Photovoltaic roofing shingles

Photovoltaic glazing



McCormack Place will receive a green roof on the terrace between the towers as part of a Sustainable Design rehabilitation. Illustrations courtesy of Goody Clancy Architects

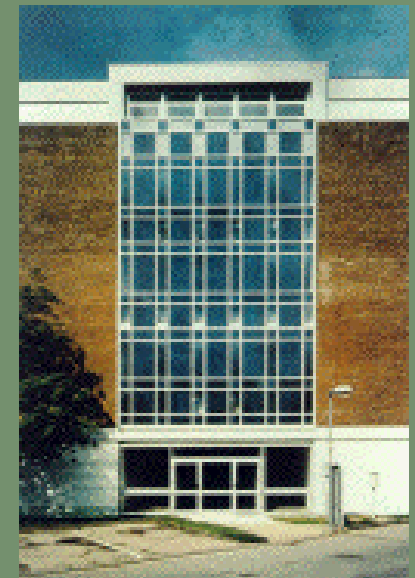


Geothermal wells for Trinity Church in Boston are part of a Green HVAC system which relies on less fossil fuel usage. Illustrations courtesy of Goody Clancy Architects



## New Products – Photovoltaic Glass

New products have real potential in modern settings and discreet locations on historic buildings





- Conclusion:
- Historic preservation principles call for the preservation of historic materials
- Sustainable practices should give value to retaining existing materials and character
- The public benefits both from preserving our historic heritage and protecting the earth through environmental care
- US Green Building Council should give more points ( 10) to historic projects going green