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

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.
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