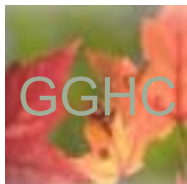




Green Guidelines for Healthcare Construction

Turning Green Into Gold
High Performance & Sustainable Healthcare Facilities



© 2004

FDA Warns Mercury in Tuna Harms Fetal Development

**Increasing Childhood Asthma Rates
Linked to Ambient Air Quality**

**Bill To Help Thousands Exposed
to 9/11 Dust Plume**



**environmental health
overview**



Building materials & designs impact health

Occupants - Patients, Staff & Visitors

Engineered wood, insulation,
carpet, resilient floor

→ phthalates, formaldehyde,
VOCs (volatile organic compounds)

→ asthma, cancer, endocrine disruption

environmental health
overview



Building materials & designs impact health

Local Community

Paint, fuels, roof coatings

→ particulates and more VOCs

→ smog, more bronchial problems



environmental health
overview

Building materials & designs impact health

Global community

PVC manufacture & disposal

→ dioxin

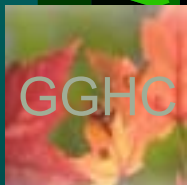
Persistent

Bioaccumulative

Toxic chemicals

→ cancer

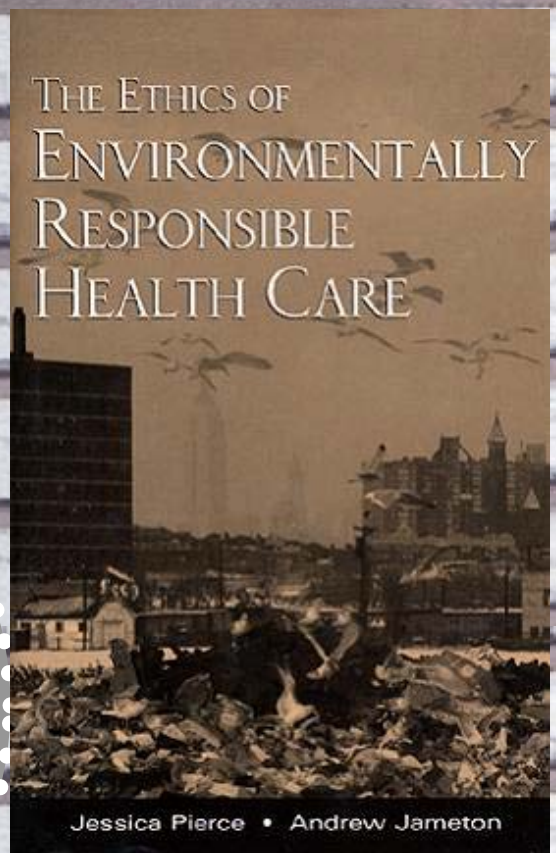
birth defects



environmental health
overview

Healthcare's
primary mission
to protect health
=
sustainability

Design &
operation of our
facilities
=
opportunities for
improvement



environmental health
overview

But what does this do for the CEO?

1. Personnel shortages
2. Reimbursement
3. Malpractice Insurance
4. Government mandates
5. Physician-Hospital Relations
6. Capacity
7. Care for the uninsured
8. Patient Safety
9. Technology
10. Patient Satisfaction



2001 ASHE Green Healthcare Construction Guidance Statement

- 1 Protect the immediate health of building **occupants**.
- 2 Protect the health of the surrounding **local community**.
- 3 Protect the health of the **global community** and natural resources.



strategies
overview



How green is my facility?

benchmark

strategies
overview





Convened by **Center for
Maximum Potential
Building Systems**



Sponsored by **ASHE**



Funded by **Merck Family Fund**

contributors
overview





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contributors
overview





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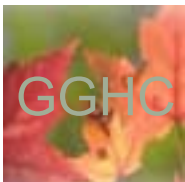
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contributors
overview



**reference
documents**

**ASHE Green Healthcare Construction
Guidance Statement (2002)**

**LEED™ Green Building Rating
System**

**Labs 21 Environmental Performance
Criteria**

**Australia Green Building Council's
Green Star**

**New York City High Performance
Building Guidelines**

**Savings by Design Healthcare Model
(Pacific Gas & Electric)**

**AIA Guidelines for Healthcare
Construction**

groundwork
overview





cost and value

health mission

healing environment

best practices

consensus

environmental health

high performance

regulatory frameworks

sources

Infection control

green guidance statement

steering
committee

additional
contributors

reference
documents



groundwork
overview



*The Green Guidelines for Healthcare Construction seeks to reward organizations that strive to engage in **environmental stewardship**, and that **lead the healthcare industry** toward high performance healing environments*

attributes
overview



Selected Green Healthcare Projects in North America

Legacy Good Samaritan Hospital
Portland, OR

McKenzie Willamette Hospital
Springfield, OR

Laguna Honda Hospital
San Francisco, CA

Marian Medical Center
CHW - Santa Maria CA

Boulder Community Hospital
Boulder, CO

St. Francis Warren MOB
Tulsa, OK

as School of Nursing
Houston, TX

St. Mary's Mercy Cancer Cntr
Grand Rapids, MI

Bloorview MacMillan Children's
Toronto, ON

Northumberland Health Cntr
Cobourg, ON

Heather Hill Wellness
Munson, OH

Logansport State Hospital
Logansport, IN

Fletcher Allen Hospital
Burlington, VT

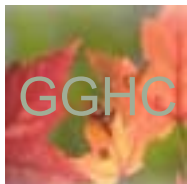
Sullivan Co. Cntr for Discovery
Harris, NY

Continuum Center for Health
Beth Israel - New York, NY





- **Built on the LEED™ framework**
- **Modified for Healthcare**
 - **Structural, usage and regulatory challenges**
 - **Emphasize environmental health issues**
 - **Bring O&M together with Design**



attributes
overview

1

Long ownership mean owners realize life cycle implications of their construction choices.

2

24/7 operations with patients in place require intensive coordination and redundancy of all services at all times.

3

Health care facilities are often **multiple building campuses** of varying ages, conditions, systems

4

The design and operation of health care buildings is **highly regulated** with intense economic and life safety oversight



design attributes
overview

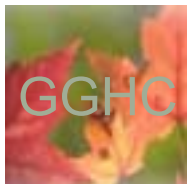


The H2E is a voluntary program designed to help health care facilities enhance work place safety, reduce waste and waste disposal costs and become better environmental stewards and neighbors.

5

Operational issue, such as mercury elimination, have defined industry's environmental stewardship

operational attributes



overview

6

Construction frequently occurs **adjacent to occupied buildings** (where health is fragile, or steadiness of hand required)

7

Infection Control Risk Assessment (**ICRA**) protocols to minimize the impacts of construction on occupants demonstrate leadership to the wider sustainable building industry

8

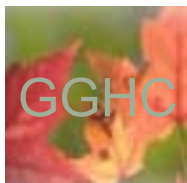
Healthcare **construction managers** can evolve a rigorous, sustainable set of practices for the healthcare industry that may inform wider construction practice



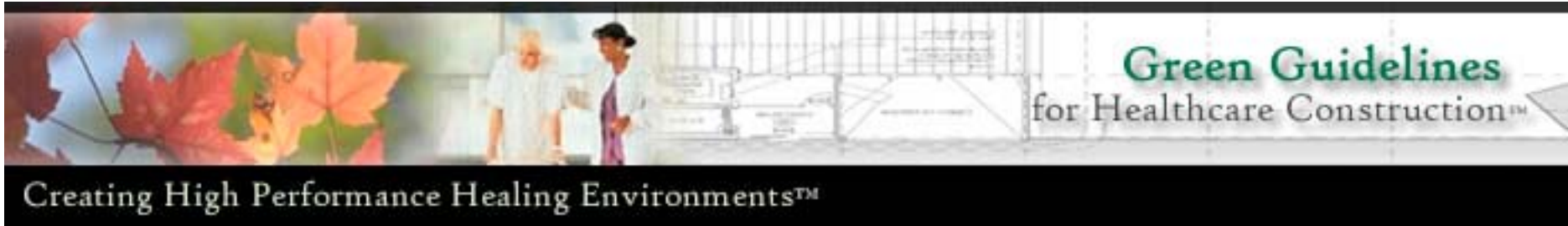
construction attributes

overview

<u>Section</u>	<u>PreReqs - Points</u>
1 – Integrated Design and Operations	4 - 0
2 – Sustainable Sites	1 - 20
3 – Water Efficiency	1 - 12
4 – Energy & Atmosphere	3 - 22
5 – Materials & Resources	2 - 25
6 – Indoor Environmental Quality	4 - 23
7 – Innovation	0 - 4



organization
overview



Green Guidelines for Healthcare Construction
Sustainable Sites

Sustainable Sites Required

SS Prerequisite 1 Erosion & Sedimentation Control

Intent

Control erosion to reduce negative impacts on water and air quality.

Health Issues

Health Issues

Controlling erosion and stormwater runoff lessens contamination of receiving waters thereby avoiding opportunities for human exposure to waterborne pollutants and toxic chemicals.

Requirements

Requirements

Design a site sediment and erosion control plan, specific to the site that conforms to United States Environmental Protection Agency (EPA) Document No. EPA-832R-92-005 (September 1992), Storm Water Management for Construction Activities, Chapter 3, OR local erosion and sedimentation control standards and codes, whichever is more stringent. Assume that the plan meets the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent blowing the air with dust and particulate matter.

Documentation

Documentation Requirements

- ☐ Declare whether the project follows local erosion and sedimentation control standards or the referenced EPA standard.
- ☐ Prepare a brief list of the measures implemented. If local standards and codes are followed, describe how they meet or exceed the referenced EPA standard.
- ☐ Prepare a Site Protection Plan and specifications, by civil engineer or responsible party, noting limits of construction and disturbance and protection measures, including erosion control measures highlighted.

Reference Standards

Reference Standards

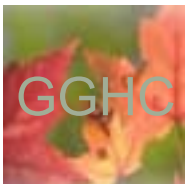
United States Environmental Protection Agency (EPA) Document No. EPA-832R-92-005 (September 1992), Storm Water Management for Construction Activities, Chapter 3, www.epa.gov

Technologies & Strategies

Technologies & Strategies

Adopt an erosion and sedimentation control plan for the project site during construction. Consider employing strategies such as temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps, and sediment basins.

Other methods include protection of existing vegetation including protection of clusters or groupings of existing vegetation (i.e. tree or shrub masses) rather than isolated plant material in order to minimize unnecessary ground disturbance (topsoil stripping) and removal of existing groundcover.

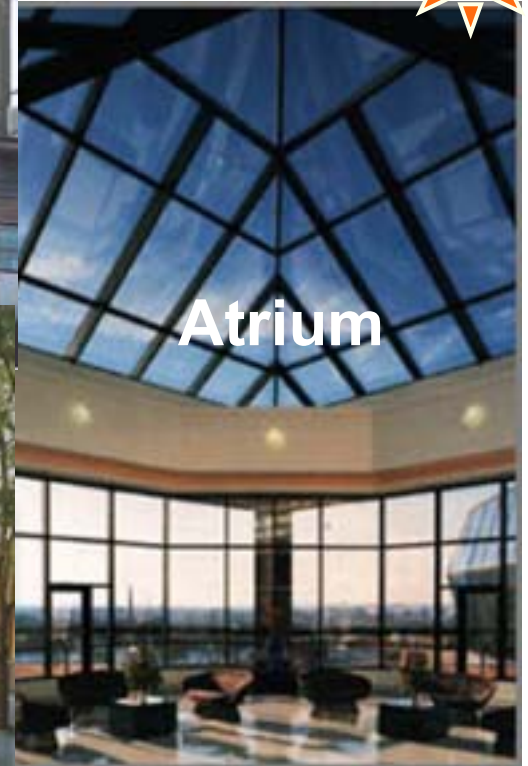
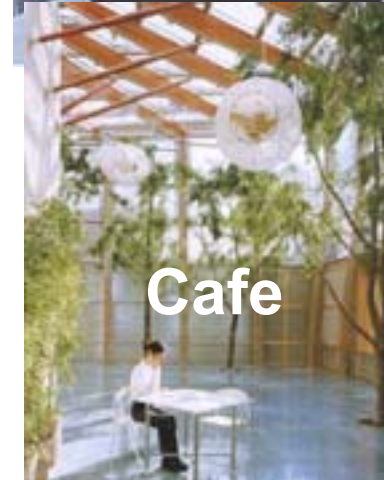


organization overview

Credit 9 Connection to the Natural World



Establish 5% of the building program as programmed **places of respite** easily accessible to patients, visitors, and staff. Provide at least one place of respite dedicated to staff and separate from patients and visitors.



sustainable sites

Credit 8: Medical Equipment

Use **Energy Star® qualified products** or equipment in the top 25th percentile for at least 75% of new equipment that is not building systems related, and at least 30% of all such equipment.



energy & atmosphere

Prereq 2: Mercury Elimination

Switches, thermostats, gauges



Low-mercury lamps

Medical devices

Dental amalgam separators

Demolition protocol



prerequisite
materials & resources

Credit 8.1: PBT Elimination - Dioxin (1):

Reduce PBT's associated with
building materials

Persistent Bioaccumulative Toxins

PVC is a major
source of dioxins

Avoid cement from
kilns fired with
hazardous waste



materials & resources



Credit 9.1: Medical Waste Reduction (1):

Reduce solid waste disposal in
landfills and incinerators

Waste management plan

Reduce total waste volume by
33% below 1998 volumes.

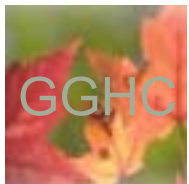
Utilize alternative waste
treatment technologies to
reduce reliance on
incineration.



Recycle

Reduce use of
disposables

Reduce packaging



materials & resources

Credit 3: Construction IAQ Management Plan (2):

During construction and before
occupancy

3.1 During construction:
IAQ management plan.

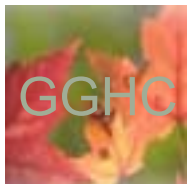
3.2 After construction:
2-week minimum flush out
OR

Baseline IAQ testing procedure



JCAHO outline
for IAQ
Management
Plans

ICRA protocols



environmental quality

“Healing
Potential?”



Credit 8: Daylight and Views (3):
Provide occupants with connection
between indoor spaces and the outdoors.

- 8.1 2% **daylight** factor -
- In 75% of Nursing units
 - Surgical units
(excluding ORS)
 - and D&T areas

8.2 **Views** in all the the above



environmental quality

**Architects
Engineers
Interior Designers
Builders &
Contractors**

DO Prerequisite 1: Integrated Design Process

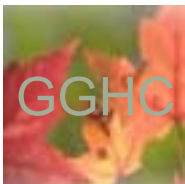
Use **cross discipline decision making** starting early in the design process & continuing throughout to maximize interrelationships between systems.

Integrated design process

**Facility managers
Administrators
Medical Staff
Patients**

winning
solutions

**Group
purchasing
organizations,
Support services**



integrated design & operations



Prereq 1 Erosion & Sedimentation Control

Credit 1 Site Selection

Credit 2 Urban Redevelopment

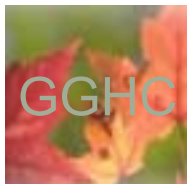
Credit 3 Brownfield Redevelopment

Credit 4.1 Alternative Transportation, Public Transportation Access

Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms

Credit 4.3 Alternative Transportation, Alternative Fuel Refueling Stations

Credit 4.4 Alternative Transportation, Parking Capacity



organization
overview

self-certifying

Points:	106 possible
80	Platinum
60	Gold
50	Silver
40	Basic

organization
overview



GGHC Public Comment Draft

Released December, 2003

Version 1.0 anticipated Summer 2004

process
overview





Green Guidelines for Healthcare Construction

www.gghc.org

**Download the public comment draft now
Register for version 1.0 release this summer**

