

Building Rating Systems

Mili Majumdar
Teri

Energy environment technology



What is Green Design?

- Integrated design and construction process that significantly reduces or eliminates the negative impact of buildings on the environment and occupants .

How?

- **Ensure sustainable site planning**
- **Adopt passive solar design - design for the climate**
- **Use Efficient materials and construction practices**
- **Use efficient systems(lighting, HVAC etc.)**
- **Use renewable forms of energy**
- **Apply water and waste management strategies**
- **Ensure good health of the occupants**

What is green rating?

- Evaluate environmental performance/ **performance intent** of a building (new/existing) from a whole building perspective over its entire life cycle. The rating systems assess the “greenness” based on some **quantifiable** parameters and also recognises intent to design “green” based on **qualitative** assessment procedure.

Overview of international rating systems

Rating system vary

- Overview of some rating systems
 - LEED
 - BREEAM-UK
 - BREEAM-Canada

LEED™ Rating System

Design Categories

LEED green building rating system is a voluntary, consensus based market driven rating system that is based on accepted energy and environmental principles and strikes a balance between established practices and emerging concepts. It evaluates environmental performance from whole building perspective .

LEED™ Rating System Design Categories

Credits Points

8	14	Sustainable Sites
3	5	Water Efficiency
6	17	Energy and Atmosphere
7	13	Materials and Resources
8	15	Indoor Environmental Quality
	64	
	4	Design Process and Innovation
	1	LEED™ Accredited Designer
	69	TOTAL Points Available

Source: US green building council-LEED rating for buildings

LEED™ Rating System

- Self-assessing system to guide project development
- 4 levels of certification
 - LEED™ Certified 26 - 32 points
 - Silver Level 33 - 38 points
 - Gold Level 39 - 51 points
 - Platinum Level 52 + points

Source: US green building council-LEED rating for buildings

SUSTAINABLE SITES

Prerequisite: Erosion and Sedimentation Control

Credit 1: Site Selection

Credit 2: Urban Redevelopment

Credit 3: Brownfield Redevelopment

Credit 4: Alternative Transportation

Credit 5: Reduced Site Disturbance

Credit 6 : Stormwater Management

Credit 7: Landscape and Exterior Design to Reduce Heat Islands

Credit 8: Light Pollution Reduction

WATER EFFICIENCY

Credit 1: Water Efficient Landscaping

Credit 2: Innovative Wastewater technologies

Credit 3: Water Use Reduction

ENERGY AND ATMOSPHERE

Prerequisite 1: Fundamental Building & Systems Commissioning

Prerequisite 2: Minimum Energy

Performance

Prerequisite 3: CFC Reduction in HVAC&R Equipment

Credit 1: Optimise Energy Performance

Credit 2: Renewable Energy

Credit 3: Additional Commissioning

Credit 4: Elimination of HCFC's and Halons

Credit 5: Measurement and Verification

Credit 6: Green Power

MATERIALS AND RESOURCES

Prerequisite: Storage & Collection of Recyclables
Credit 1: Building Reuse
Credit 2: Construction Waste Management
Credit 3: Resource Reuse

Credit 4: Recycled Content
Credit 5: Local/Regional Materials
Credit 6: Rapidly Renewable Materials
Credit 7: Certified Wood

INDOOR ENVIRONMENTAL QUALITY

Prerequisite 1: Minimum IAQ Performance
Prerequisite 2: Environmental Tobacco Smoke (ETS) Control
Credit 1: Carbon Dioxide (CO₂) Monitoring
Credit 2: Increase Ventilation Effectiveness
Credit 3: Construction IAQ Management Plan

Credit 4: Low-Emitting Materials
Credit 5: Indoor Chemical and Pollutant Source Control
Credit 6: Controllability of Systems
Credit 7: Thermal Comfort
Credit 8: Daylight and Views

TOTAL CORE LEED RATING SYSTEM POINTS 64

INNOVATION AND DESIGN PROCESS POINTS 5

BREEAM-UK

BREEAM-UK

- Three types of assessments
- Environmental performance index only (for vacant offices with shell or where shell and services are only installed)
- Design and procurement assessment (assesses environmental performance and design and procurement rating for new buildings)
- Management and operation assessment (assesses environmental performance and management and operation for rating for existing buildings)

How does BREEAM work?

- BREEAM assesses the performance of buildings in the following areas:
 - **management**: overall management policy, commissioning site management and procedural issues
 - **energy use**: operational energy and carbon dioxide (CO₂) issues
 - **health and well-being**: indoor and external issues affecting health and well-being
 - **pollution**: air and water pollution issues
 - **transport**: transport-related CO₂ and location-related factors
 - **land use**: greenfield and brownfield sites
 - **ecology**: ecological value conservation and enhancement of the site
 - **materials**: environmental implication of building materials, including life-cycle impacts
 - **water**: consumption and water efficiency

BREEAM CANADA (existing bldgs)

- BUILDINGS assessed in a comprehensive manner : energy, environmental quality, health, operation and management of the building in terms of the following Global Issues, Local Issues, Indoor Issues and Management Issues:
- **Global Issues**
 - *Energy-saving and emission control features of the building are noted and from these, the carbon dioxide emissions are evaluated.*

- ❑ *Ozone Depletion* Measures for reducing the ozone depletion potential of the building are credited.
- ❑ *Acid Rain* Better-designed combustion equipment reducing emissions of oxides of nitrogen is credited.
- ❑ *Recycling/Re-use of materials*, particularly incorporation of separate storage facilities for recyclable materials, and waste audit policies and procedures are eligible for credits.

■ **Local Issues**

- *Water Economy* measures are credited.
- *Energy efficient transportation* to the building is credited.
- *Microbial Contamination* prevention measures from wet cooling towers , domestic hot water are credited.

- **Indoor Issues**

- *High* frequency lighting, which reduces headaches and eyestrain, is credited.
- *Indoor Air Quality* management in terms of ventilation, filtration and humidification is credited.
- *Hazardous Materials* management and/or avoidance of hazardous materials, i.e. asbestos, lead based paints, or lead pipes is credited.
- *Radon* management particularly in areas, which are known to be at high risk, is credited.

■ **Management Issues**

- *Environmental Policy* and purchasing policies are credited.
- *Energy Management*, such as an energy policy, energy audit, energy monitoring and targeting, and tenant and building operator energy awareness programs, regular system maintenance schedule and service operation manuals obtains are credited.
- *Environmental Management* Good management practices concerning ozone depleting substances, indoor air quality, microbial contamination, hazardous materials, and noise control in the building are evaluated and credited.
- *Building Maintenance* for the building fabric and services is credited.
- *Healthy Building Indicators* known to be related to the risk of sick building syndrome are credited.

Discussions.....

In conclusion....

- Rating systems