



WELCOME



GREEN
BUILDINGS-
AN ASSET TO
ENERGY &
ENVIRONMENT
SAVING

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INTRODUCTION

WHAT IS A GREEN BUILDING?

A Building which promotes

- Energy conservation,
- Encourages optimum use of resources mitigates negative impact on environment and people
- Also known as Green construction or Sustainable building.

Benefits

- Environmental
- Economic
- Community and corporate
- Health and safety

Salient Features of a Green Building

- ❖ Effective Use of soil & Landscapes
- ❖ Efficient Use of Water
- ❖ Energy Efficient &
Eco Friendly Equipment
- ❖ Effective Control & Building
Management Systems
- ❖ Use of Renewable Energy
- ❖ Use of Recycled/Recyclable Materials
- ❖ Improved indoor air quality
for health and comfort



CII-IQ Building, Bangalore

GOALS

- ❖ Siting and structure design efficiency
- ❖ Energy efficiency
- ❖ Water efficiency
- ❖ Materials efficiency
- ❖ Indoor environmental quality enhancement
- ❖ Operations and maintenance optimization
- ❖ Waste reduction
- ❖ Cost

Green Building vs. Conventional Building

- ❖ Externally : both look alike
- ❖ Building Use : both are same
- ❖ Differences
 - Operational savings
 - Concern for human comfort indoor environment

Tangible Benefits

- ❖ Reduce operating costs from day one
- ❖ Energy savings: 40 – 50 %
- ❖ Water savings: 20 – 30 %
- ❖ Reduction in initial investment

Health and Safety benefits

- ❖ Enhance occupant comfort

Improve Productivity of occupants

- ❖ 12-15 % improvements documented in schools & other buildings



CII-Godrej GBC, Hyderabad Platinum Rating

Cost of Green Buildings - Indian Experiences

Building	Year awarded	Built-in Area (Sqft)	Rating Achieved	% increase in cost	Payback (Yrs)
CII-Godrej GBC, Hyderabad	2003	20,000	Platinum	18 %	7 years
ITC Green Centre, Gurgaon	2004	1,70,000	Platinum	15 %	6 years
Wipro, Gurgaon	2005	1,75,000	Platinum	8 %	5 years

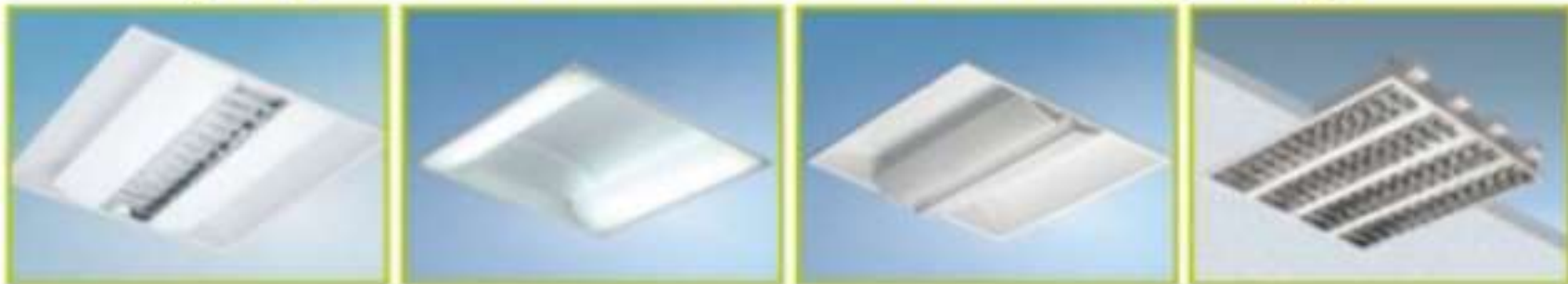
Recently Rated Green Buildings

Technopolis, Kolkata	2006	72,000	Gold	6%	3 years
Spectral Services Consultants Office, Noida	2007	15,000	Platinum	8%	4 years
HITAM, Hyderabad	2007	78,000	Silver	2%	3 years

Lighting Controls

- Automatic Control of Lighting proposed for utilizing natural day light
- The lighting fixtures controlled Light (Lux) Sensors coupled with presence sensors reduce Electrical Lighting .
- Light Pollution reduced using Indoor and Outdoor Fixtures

Light pollution reduction – Interior lighting



Light pollution reduction – Exterior lighting



IBMS

The objective of the **Integrated Building Management System** :

1. Centralize the monitoring,
2. Controlling operations
3. Management of facilities within the building
4. To achieve more efficient building operations at reduced energy and labor costs
5. Providing a safe and quality working environment to the occupants.

Examples:

Heating Ventilation and Air conditioning system

Smoke control

Intelligent Fire Detection & Alarm Systems

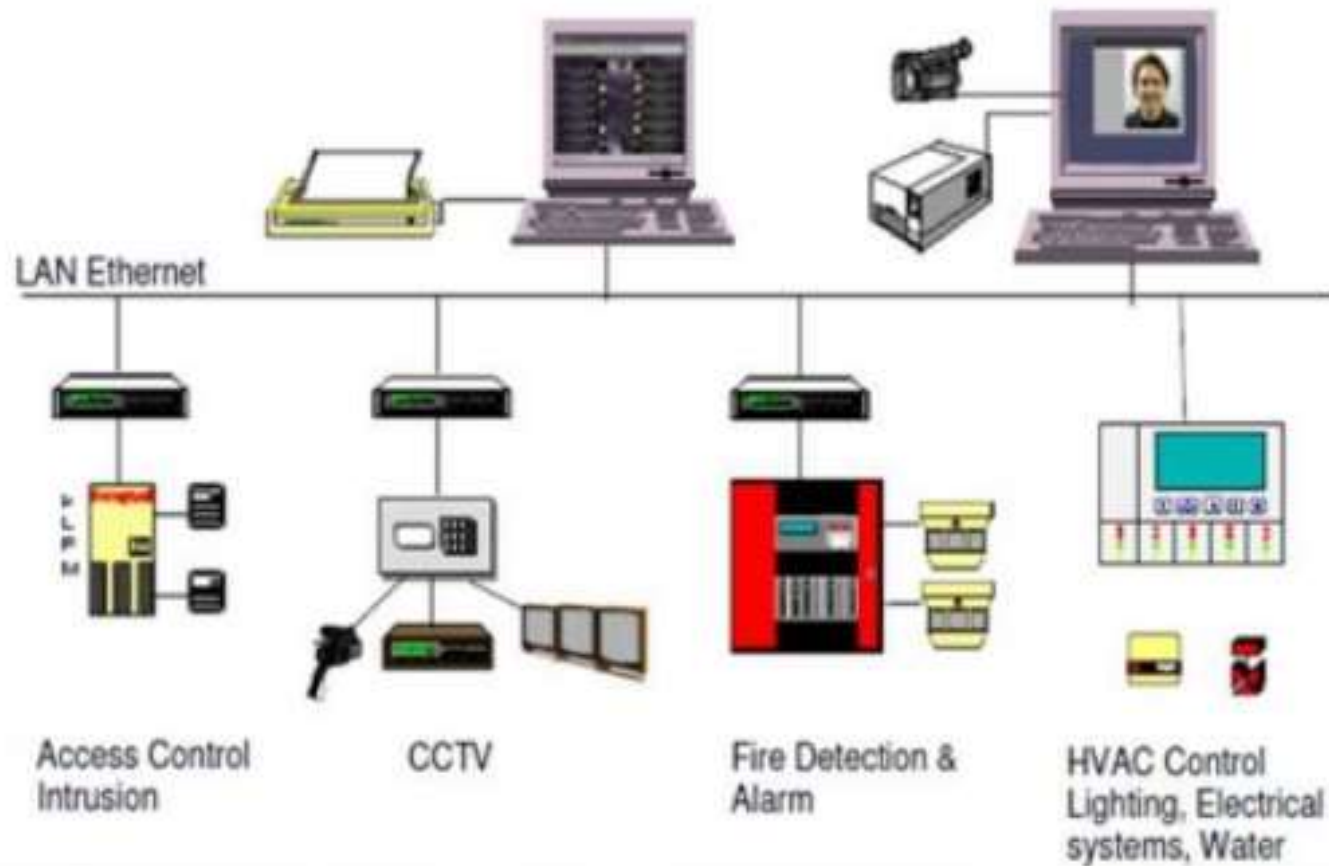
Fire Suppression Systems

Access Control Systems

CCTV Systems



**INTEGRATED BUILDING MANAGEMENT SYSTEM
EXAMPLE ARCHITECTURE**



LEED

- Green building certification system, providing third party verification that a building was designed applying green technology.
- It is a voluntary, market-driven building rating system.
- Certification obtained after submitting an application document in compliance with the requirements of the rating system as well as paying registration and certification fees.

IGBC

- Consensus driven non-profit council representing the building industry, consisting of more than 500 committed members.
- Encourages builders, developers and owners to build green.
- Council members work together to evolve guidelines, policy positions, and to create educational forums that facilitate sustainable practices.

Credit Point Thresholds for Different Levels of Certification:

Certification	Points
Certified	40-49
Silver	50-59
Gold	60-79
Platinum	80 and above

CHECKLIST FOR GREEN HOMES		Points Available	
		Projects with Interiors	Projects without Interiors
Site Selection and Planning			
Mandatory Requirement 1	Local Regulations	Required	Required
Mandatory Requirement 2	Soil Erosion	Required	Required
Site Credit 1.0	Basic Amenities	1	1
Site Credit 2.0	Natural Topography or Landscape : 15%, 25%	2	2
Site Credit 3.0	Heat Island Effect - Roof : 50%, 75%	2	2
Site Credit 4.0	Parking Facilities for Visitors	1	1
Site Credit 5.0	Electric charging Facility for Vehicles	1	1
Site Credit 6.0	Design for Differently Abled	1	1
Site Credit 7.0	Green Home Guidelines - Design & Post Occupancy	NA	1
		8	9
Water Efficiency			
Mandatory Requirement 1	Rainwater Harvesting, 50%	Required	Required
Mandatory Requirement 2	Water Efficient Fixtures	Required	Required
Water Credit 1.0	Turf Design : 20%, 40%	2	2
Water Credit 2.0	Drought Tolerant Species : 25%	1	1
Water Credit 3.0	Management of Irrigation Systems	2	2
Water Credit 4.0	Rainwater Harvesting : 75%, 95%	2	2
Water Credit 5.0	Grey Water Treatment : 50%, 75%, 95%	3	3
Water Credit 6.0	Treated Grey Water for Landscaping : 50%, 75%, 95%	3	3
Water Credit 7.0	Treated Grey Water for Flushing : 50%, 75%, 95%	3	3
Water Credit 8.0	Water Efficient Fixtures : 20%, 30%	3	3
Water Credit 9.0	Water Metering	1	1
		20	20
Energy Efficiency			
Mandatory Requirement 1	CFC Free Equipment	Required	Required
Energy Credit 1.0	Energy Performance	10	10
Energy Credit 2.0	Energy Metering	1	1
Energy Credit 3.0	Refrigerators	1	NA
Energy Credit 4.0	Solar Water Heating Systems : 50%, 75% , 95%	3	3
Energy Credit 5.0	Captive Power Generation	1	1
Energy Credit 6.0	On-site Renewable Energy : 2.5%, 5.0%, 7.5%, 10%	4	4
Energy Credit 7.0	Efficient luminaries & Lighting power density : 20%	1	1
Energy Credit 8.0	Energy Saving Measures in Other Appliances & Equipment	1	1
		22	21
Materials			
Mandatory Requirement 1	Separation of Waste	Required	Required
Material Credit 1.0	Waste Reduction During Construction : 75%	1	1

Green Buildings in India

- **Biodiversity Conservation India Ltd (BCIL) - Bangalore**
- **Suzlon Energy Limited - Pune**
- **Olympia Technology Park - Chennai**
- **ITC Green Centre - Gurgaon**
- **The Druk White Lotus School - Ladakh**
- **La Cuisine Solaire - Auroville**
- **Doon School - Dehradun**
- **Kakkanad, Cochin ,IT Building**

CONCLUSION

Green Buildings,

- ❖ Efficiently uses energy, water, and other resources.
- ❖ Protects occupant health and improves employee productivity.
- ❖ Reduces waste, pollution and environmental degradation

So, they are the future for saving energy & environment.

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THANK YOU