

## Quantifying the viability of Existing Building into Green Building

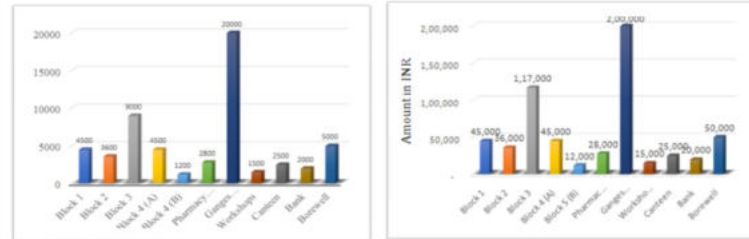
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### Introduction:

- Now a days, corporate and individuals give cautious thought to ecological security, thus build up another pattern called "Green Buildings".
- Green building is also known as a sustainable or high-performance building.
- The "Green Building" is an interdisciplinary theme, where the green building idea incorporates a large number of components, segments and methodology which turn to a few sub-topics that laced to frame the green building thoughts.
- Green buildings are designed in such a way to reduce over-all impact of environment on human well-being and the common habitat by:
  - Efficient use of Energy, water and other resources
  - Protecting occupant health and improving employee / student productivity
  - Reducing waste, pollution and environmental degradation.
- The current study concentrates to assess the possibility of Gokaraju Rangaraju Inst. of Engg. & Tech. (GRIET campus), Hyderabad to obtain green building certification for its various green features according to the Leadership in Energy and Environmental Design (LEED) rating framework.
- Recommendation of retrofitting to improve the green features of the GRIET campus



### Analysis:



Plot 1 Block wise Energy Consumption & Energy bill per month

Total Electricity Consumption (units)	56,600	Total Electricity Consumption (units)	42,400	Net Savings (Rs) – (per Month)
Electricity Bill (Rs 10 / unit) without Solar	5,66,000/-	Electricity Bill (Rs 10 / unit) with Solar	4,24,000/-	

### Scope of Work:

Table 1. Assignment of LEED Credits for GRIET Campus

Aspects of Green Building	Max. Credits	Obtainable Credits
Energy and Atmosphere	49	20
Energy, water efficiency and Atmosphere		
Indoor Environmental Quality and Innovation in Design	21	9.5
Sustainable Sites, Materials and Resources	26	4
Location & Transportation and Regional Priority	14	6.5
<b>Total Credits</b>	<b>110</b>	<b>40</b>

- From the above table, the GRIET campus has obtained 40 credits.
- Hence the GRIET campus satisfies the minimum criteria under the 'CERTIFIED' category according to LEED standard (40 – 49 credits).

### Conclusions:

- Based on physical observations following suggestions are made to improve the certification level of GRIET campus.
  - Use of low emitting vehicles like battery charged vehicles, CNG cars etc. helps in reducing indoor air pollution, Heat island reduction can be done by Green Roof techniques, recycling of waste materials and so on.
- Hence, by retrofitting further to improve additional 20 credits in the field of water conservation, energy & atmosphere and indoor air quality to fall under "GOLD" category.

### Important References:

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- Prakash A and Gopal N.M (2017), "Analysis of Green Buildings – Case Study CII Shohrabji GBC", 3rd National Conference on Innovative Research in Civil Engineering, ISBN 978 93 83038 527, pp: 69-83.
- Mr. Ranjith Kumar Sharma (2010) Titled "Rain Water Harvesting at N.I. T Rourkela" Project Report Submitted Under the Guidance of Prof. K.C. Patra & Prof. Ramakar Jha in N.I.T Rourkela
- URL: www.igbc.com

### Literature:

- According to the LEED (USGBC), with an upfront investment of 2% in green building design, the resulting life savings is 20% of the total construction costs.
- Along with this increase in monetary savings, green building and architecture has been proven to make the occupants more productive.
- Studies have shown a link between improved lighting design and a 27 % reduction in the incidence of headaches.
- Also, students with the most day lighting in their classrooms progressed 20 % faster on math tests and 26 % faster on reading tests in one year than those with less day lighting.
- There are four categories in the LEED – EB, operation and maintenance (O&M) rating framework (Credits).
- The categories are separated by a range of credits that can be achieved by satisfying a combination of LEED categories.

### Methodology:

- we have proposed to assess credits to rate the GRIET campus for its various green features according to the rating framework of LEED and suggest measures to improve the green performance of the building.
- Shape of building:
  - Unrestricted circulation of air
  - Limitless flexibility in design layout
  - Stronger than conventional square building
  - Best architecture aspect.
- Most impressive feature of the GRIET is in its energy & water efficiency, natural lighting system and rain water harvesting.
- Green Features incorporated in GRIET campus are:

