

# Applying Green Building Concepts in Conventional Construction Industry

Nihar Talati<sup>1</sup> Prof. Anand Patel<sup>2</sup>

<sup>1</sup>P.G Student <sup>2</sup>Assistant Professor

<sup>1,2</sup>Department of Civil Engineering

<sup>1,2</sup>IITE, Indus University, Ahmedabad-382115

**Abstract**— Nowadays we are facing various environmental impacts due to which we need to build with more sustainable materials which will lead to reduction of impacts on environment. Developers need to find better, more sustainable methods of designing their buildings in order to reduce their negative environmental impact. Therefore, it is need of an hour to use more sustainable materials and locally available materials which are eco-friendly and a lead for better tomorrow. Refurbishing conventional buildings into green buildings can increase sustainability. Further, analysis focuses on identifying methods and indicators that can be adopted for the assessment of green potential. As there are many green building assessment bodies are there for green building point system such as IGBC, LEED, GRIHA etc. for evaluation of green building.

**Key words:** Green building, Sustainability, conventional method, construction

## I. INTRODUCTION

According to environmental protection agency(EPA), Green building (also known as green construction or sustainable building) refers to both a structure and the using of processes that are environmentally responsible and resources efficient throughout a building’s life-cycle: from sitting to design, construction, operation, maintenance, renovation and demolition. Today, buildings worldwide account for up to 40% of total end-use energy. there is over 50% saving potential in the building sector and thus it is considered as a potential sector to meet the challenges of global energy and climate change.

Today, buildings worldwide account for up to 40% of total end-use energy. There is over 50% saving potential in the building sector and thus it is considered as a potential sector to meet the challenges of global energy and climate change. [2]

## II. NEED OF STUDY

Green buildings are very much in need because “Built Environment” is major source of:

- CO2 (Greenhouse Gas) Emissions
- Energy and Water Consumption
- Conventional Water and Air Pollution
- Solid Waste Stream

Impact of Buildings on Natural Resources Green Buildings creates opportunities for big reductions because buildings account for:

- 39% of total energy use
- 72% of electricity consumption
- 38% of CO2 emissions
- 40% of raw materials use
- 12% waste output

- 30% of potable water consumption[4]
- Average Reductions by “Green” Buildings:
- Energy Use - 30%
  - CO2 Emissions - 35%
  - Water Use - 30% - 50%
  - Waste Creation - 50% - 90%

## III. BOUNDARY OF STUDY

- Study and analysis of various green building aspects.
- Various green building aspect findings which can be adopted on the project.
- Cost analysis of those findings.
- Comparison of conventional methods and green building aspects.
- Possible benefits to the project.

## IV. PROPOSALS

### A. Moistube Sub-Surface Slow Release Irrigation

Conventional method				Moistube irrigation			
Area (In sq. mt.)	Water used (Litres/sq.mt.)	Total l/day	Per annum	Area (In sq. mt.)	Water used (Ltrs/sq.mt.)	Total l/day	Per annum
1916.22	4.5	8623	3147395	1916.22	0.3	575	209875

Table 1: comparison of conventional method and moistube irrigation [3]

### B. Use of Fly Ash

### C. Cost Comparison

If we consider 150 Rs. Per bag for fly ash and 300 Rs. Per bag cement, then

Concrete casting in one block-3800 cubic meter

Taking concrete grade as M25, 6.5 bags will be required for 1 cubic meter of concrete.

Hence, 3800\*6.5=24,700 bags will be required.

Now, if 15% of fly ash addition in place of cement, then 3705 fly ash bags will be required and cement bags will be reduced to 20995.

Cost reduction in concrete: 3705\*150=5, 55,750 for 1 block if 15% of fly ash is used in place of cement.

Hence, total savings in the project=55,750\*6=Rs.3,34,500[5]

D. Low VOC paint

Asian Paints	Berger Paints	Dulux	Nerolac
			
Royale Aspira	Breathe Easy	Enviro2	Impressions Eco Clean
28 gm/lVOC	8.4 gm/lVOC	22 gm/lVOC	No VOC
Rs 600 per litre	Rs 630 per litre	Rs 590 per litre	Rs 780 per litre

Fig. 1: types of paints

Quantity of paint in one block:

Internal paint (one unit):311.72 sq.mt.-3354.1 sq.ft.

Passage (lift area): 16.90 sq.mt.-181.8 sq.ft.

Internal paint (one floor):2493.82 sq.mt. – 26833.5 sq.ft.

Total internal quantity of one floor=26833.5+181.8 = 27015.3

So, paint required for one unit = 74.53 (approximately 75 liters)

Paint required for one floor=600 liters

Paint type	Name	Cost/litre	Total cost/floor	Total cost/block
Conventional	Royale Shyne Luxury Emulsion	Rs.512	3,07,200	37,37,600
Low VOC	Royale aspira	Rs.600	3,60,000	43,80,000

Table 2: cost comparison of conventional paint and low VOC paint

It takes 17.20% more price initially to go with low VOC paints as compared to conventional paints but low VOC paint is more beneficial environmentally and even financially by means of longer duration.

V. CONCLUSION

Though some of the green building aspects/materials are costlier initially than the conventional ones, they pay off in later stages by reducing operation and maintenance cost and by providing much needed benefits to environment and humans as well. Green aspects/materials are cheaper in case of life cycle cost as compared to conventional aspects/materials.

REFERENCES

- [1] [www.indiana.edu/~sustain/programs/green-building/background.php](http://www.indiana.edu/~sustain/programs/green-building/background.php)
- [2] [fairtrade.travel/uploads/files/manuals/Product/.../A/.../What\\_is\\_a\\_green\\_building.pdf](http://fairtrade.travel/uploads/files/manuals/Product/.../A/.../What_is_a_green_building.pdf)
- [3] [www.advaitaa.com/moistubeirrigation](http://www.advaitaa.com/moistubeirrigation)
- [4] [www.wncgbc.org/about/importance-of-green-building](http://www.wncgbc.org/about/importance-of-green-building)
- [5] [Grihaindia.org](http://Grihaindia.org).