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Green Building Effect in Commercial Building

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Abstract : *The key reason behind any environmental strain is the haphazard usage of global natural resources leading to, pollution in the environment, sea level rising, warming the earth, depletion of natural resources etc. The drastic climate variation has been observed worldwide, which in fact is mainly due to the release of CO2 from every energy actions. The building sector consumes nearly 40 % of the total energy and accounts for 30 percent of world greenhouse gas emissions. With all the green features modeled, the project building could achieve 33.76% energy improvement over the baseline building in the present model. The formulated water conservation strategy includes recycled water from sewage, rainwater harvesting, metering and sub metering, and low flow fixtures. The maximum quantity of recycled water generated inside the building is 157.3 KL/month and the total saving of freshwater is 53.85%.*

Keywords: *Green building, Energy efficiency, GRIHA, Water efficiency, Green roofing, Parking system.*

I. INTRODUCTION

Due to rapid industrialization and urbanization, big cities are leading the economy and home to cover 1.25 billion people living in various climatic regions of India. Energy is the first and foremost universal means of all kinds of work by everyone including nature. Whatever process that occurs in any human activities that follow the flow of energy. Energy consumption in developing countries is increasing in galloping speed. It is established that the limited conventional energy sources are depleting day by day and it is not too late to start using renewable sources of energy. Overall the building sector consumes more than 20% of the total energy in the world. India's national statistical organization published the energy statistics in India, it shows that electricity accounted for more than 57% of the total consumption of energy during the year 2011-12, the building sector consumes nearly 40 % of the total energy and accounts for 30 percent of world greenhouse gas emissions . India is still to build 70% of the buildings that are expected to be in the year 2030. Providing thermal comfort of these buildings through conventional air conditioning would require about 700% residential Air conditioners in numbers. Alarmingly the power required to provide thermal comfort in commercial and residential buildings of India would require more than 20 times the present number of power plants by the year 2030. If the timely precautions are not taken to prevent this scenario the air conditioners would emit 338 MT of CO2 by the year 2030. The green concept in building is an explanation/solution to environmental strains such as contamination, water use, energy consumption and material use.

II. METHODOLOGY

Green Roofing:

Green roof can be defined as a roof that contains plant or vegetation and it may be fully or partially covered on the roof and it's an addition on a normal concrete decked roof (Dvorak, 2010). Green roof has several layers. The top layer is the vegetation stratum, followed by growing medium or soil layer, irrigation layer, filter fabric layer, drainage layer, waterproofing membrane layer, and then the roof deck. Green roofs cost more than the normal traditional roof but it has its own advantages and benefits on the long run which will counter the initial cost of installation.

Rain Water Harvesting:

Rain water harvesting is the process of collecting rain water as much as possible and storing it for further beneficial use. In desert or areas where overall rainfall is comparatively less the rain water harvesting (RWH) is the key measure or solution to drought.

Methods of Rain Water Harvesting (RWH) :

Surface runoff harvesting

Rooftop rainwater harvesting

HVAC System:

Although HVAC systems offer many opportunities for recovery and re-use of thermal energy, the preferred solution is to use less energy in the first place. This is achievable by more energy efficient buildings, systems and equipment and through improved operating and maintenance procedures. More attention should be paid to the thermal characteristics of building and strategies for minimizing internal loads, examining in detail the opportunities for natural ventilation and day lighting, and exploring ways to reduce the energy requirements of HVAC. For example, the use of high-performance glazing, insulation, and effective sun control can substantially reduce cooling and heating loads and the size of HVAC systems and components required to meet these loads. The ultimate objective is to minimize refrigeration requirements, or do away with refrigeration altogether, and to make use of renewable energy resources.

Glass facades:

There are four main Principles of glass facade performance. A glass facade for building envelopes separates the interior environment from the exterior one. Differences in the two environments generate environmental loads. The most important of these environmental loads can be categorized as: temperature, moisture, and air pressure. Temperature load is generated by both exterior temperature factors [i.e., exterior air temperature, solar radiation, and wind], and interior temperature factors [i.e., occupant activities, ventilation, and heating equipment]

Grey Water Reuse System:

While a typical application for greywater may include capturing a residential home's water to be used later in the garden, greywater principles can be used in even the largest commercial settings. The most common use for greywater is to flush toilets. Greywater is collected, filtered, and recycled in commercial bathrooms. Another common use is to collect greywater and use it to irrigate the surrounding landscaping. Further, greywater can be reused in the building's cooling systems. Using greywater for other purposes throughout a commercial building can reduce the draw on city water by nearly 75%. Many existing buildings, such as the Margot and Harold Schiff Residences - Mercy Housing and the Quayside Village greywater Demonstration Project are seeing remarkable success and energy reductions by employing greywater reuse technology.

III. CONCLUSION

Advantages:

- Environmental Benefits.
- Reduction of Emissions.
- Conservation of Water.
- Reduced localized flooding.
- Waste reduction.
- Economic benefits.

- Low utility bills.
- Increase in likelihood for the property to be sold or let. ● Social Benefits.
- Improvement to the occupant's health.
- Preservation of the natural environment.
- Increased recreation and exercise opportunities.

Disadvantages:

- Initial cost.
- Funding for projects from banks is hard to get.
- Location Factor.
- Availability of Materials.
- Timescale.

As you can see there are significantly more Advantages than Disadvantages of Green Building.

IV. OBJECTIVE

1) Energy Efficiency
2) Water Efficiency
3) Indoor Air Quality
4) Waste Reduction
5) Designe Efficiency
6) Material Efficiency

V. PROBLEMS

1) Limited Awarness
2) Inadequate Government policies & Procedure
3) Extra Clearance And Approvals
4) Deficient Incentives To Encourage Adoption
5) Expensive Equipment And Products
6) Lack Of Skilled Manpower And Subject Matter Experts

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