

APPLICATION OF GREEN BUILDING CONCEPTS FOR A RESTAURANT

Prajwala C¹, Sandhya Ursu H C², Priya Rudrashekhar Biradar³, Sahana A⁴,
Dr.M.C Sampath kumar⁵, Dr. Manjunath⁵

¹Student, Civil Engineering, BMS College of Engineering, Karnataka, India

²Student, Civil Engineering, BMS College of Engineering, Karnataka, India

³Student, Civil Engineering, BMS College of Engineering, Karnataka, India

⁴Student, Civil Engineering, BMS College of Engineering, Karnataka, India

⁵Professor, Civil Engineering, BMS College of Engineering, Karnataka, India

ABSTRACT

A Green building is one which uses less water, improves energy efficiency, conserves natural resources, generates less waste and provides healthier space for occupants. A green building concept is applied to the restaurant to reduce the negative impact on the natural environment by means of effective site selection, use of locally available materials for the construction such as Bamboo, sand bags and also use of recycled material like fly ash. Building will be energy efficient that can be done by conservation of resources like water, solar, wind and also by waste management. The building can be built with energy efficiency by using solar for solar heaters, solar light, and solar cookers. Rain water harvesting and roof top harvesting can reduce the dependence on municipality water supply. The waste from the restaurant can be dumped in the soil and later can be used as manure for plants.

Keyword: *Green building, eco-friendly*

1. GREEN BUILDING

Green building is one which uses less water, improves energy efficiency, conserves natural resources, generates less waste and provides healthier space for occupants.

Green building certification is done by US green building council's **leadership in energy and environmental design (LEED)** at international level and **Green Rating for Integrated Habitat Assessment (GRIHA)** at national level. Green building certification is a tool used to assess the attributes of a building design and construction with respect to site, water, energy, material and indoor environment.

Objective of LEED certification is the building should operate efficiently and has minimized impact on the environment. Low operating cost, Reduce energy consumption without sacrificing the comfort levels, reduced air and water pollution less construction waste, greater resale value and improved indoor quality are the benefits of green building. Green building reduces maintenance costs.

1.1 Field Studies

For the design of green building a site is selected with an area of one acre which is located in Honnudiike, 15 kilometers away from Tumkur. The effective site selection is basic component of a green building. Site is selected on the basis of direction of wind, location of the site, availability of resources and population of the area.

2. GREEN BUILDING COMPONENTS

The three main components identified for the restaurant are Green wall, ventilation and skylight roofing. With these components the building is made eco-friendly and sustainable.

2.1 Green Wall

A green wall is a vertical greening typology, where a vertical built structure is intentionally covered by vegetation. Green walls include a vertically applied growth medium such as soil, substitute substrate, or hydroculture felt; as well as an integrated hydration system. They are also referred to as living walls or vertical gardens, and widely associated with the delivery of many beneficial ecosystem services.

In the restaurant design, a tray system type of green wall is used in which plants are pre-grown off-site and inserted into the wall which allows for a great degree of flexibility. Vegetables used for cooking in the restaurant can be grown on this green wall which reduces the cost.



Fig1: Green wall

2.2 Ventilation

It is necessary in buildings to remove 'stale' air and replace it with 'fresh' air, Natural ventilation is driven by pressure differences between one part of a building and another, or pressure differences between the inside and outside.

Natural ventilation is analyzed by studying the direction of wind and circulation of air in the selected area. By placing a window in the direction of wind then the use of mechanical devices like fans and ac is reduced and also fresh air makes the customers feel good.

2.3 Skylight Roofing

Skylight roofing is a light - transmitting structure that forms all or part of the roof space of a building for daylighting purposes. Day lighting elements used to allow direct or indirect sunlight via top lighting. It provides a visual connection to the outdoor environment to interior occupants.

The restaurant will be a sustainable building with passive solar heating and with operable units ;ventilation for passive cooling and fresh air exchange. For a restaurant a glass retractable skylight rolls off the frame, so that the interior off the facility is entirely open to the outdoors.

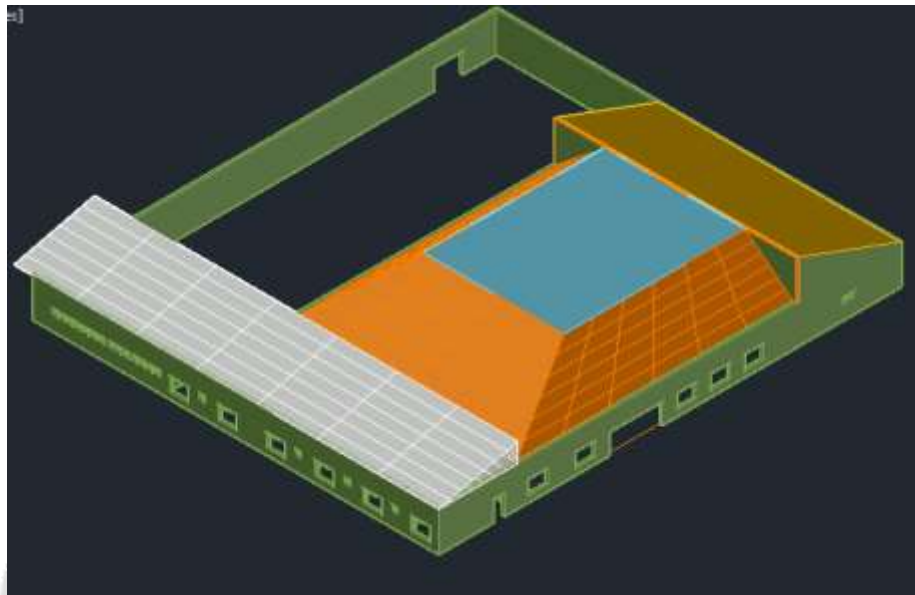


Fig2: Skylight roofing

3. DISCUSSION

Green building in its design, construction and operation, reduces or eliminates negative impacts and can create positive impacts our climate and natural environment. By reducing the levels of carbon (IV) oxide emitted to the atmosphere, they help to lessen the pace of climate change.

Green building preserves natural resources and improves quality of life.

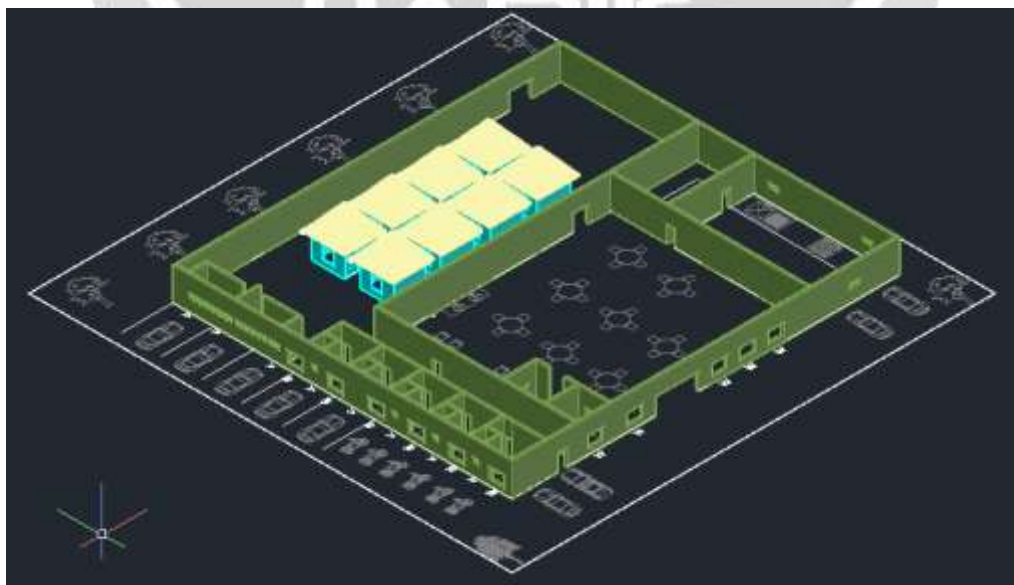


Fig3:3D view of the restaurant

3.1 Benefits of green components

A green wall increases greenspaces in the urban environment which helps to reduce the Urban Heat Island Effect, this occurs when buildings and harder surfaces absorb the sun's heat and then emit it to their surroundings. Greenwall's help to absorb sound waves and not only they give off oxygen but also clean up the pollutants in the surrounding air.

Proper ventilation helps to moderate internal temperatures and internal humidity. it replaces oxygen and reduces accumulation of moisture, bacteria, smoke and other contaminants that can build up during occupied periods. It creates air movement which improves the comfort of occupants.

Increased daylighting can result in less electrical lighting use, saves energy, lowering cost and reducing the environmental impacts. Top lighting is able to bring light into centralized areas of a building. Daylighting is both ambient lighting from the sky and direct exposure to the sun.



Fig 4: Green building parameters

A restaurant with green building components like green wall, proper ventilation and skylight roofing can reduce cost up to 40% of other conventional buildings. It also increases the productivity and also attracts people with it aesthetic looks.

4. CONCLUSIONS

A study concludes that occupants in a restaurant have significantly optimized daylighting. Daylight positively affects physiological and psychological well being, which can increase productivity in many contexts, such as by attracting customers with ecofriendly environment.

In terms of cost savings, U. S.DOE reported that many commercial and public buildings can reduce total energy costs by up to 1/3 through the optimal use of day lighting. Day lighting can cut lighting energy use in some buildings by up to 80%. Proper ventilation create air movement which improves the comfort of occupants.

A green restaurant is Sustainable and provides healthier space for occupants. It also helps in reduction of dependence on a external source for vegetables which can be grown on a green wall. Proper ventilation reduces the use of mechanical devices to circulate air.

5. REFERENCES

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