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Energy Efficient Retail and Office Spaces

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ABSTRACT—

Passive cooling features a holistic approach. As a result of it integrates the building style, material choice and techniques of construction to scale back the heating of the building or to extend the cooling, taking into cognizance the meteorology of the realm, ratio, wind direction and radiation to make conservative buildings. It is the cooling with none variety of energy input, apart from renewable energy sources. Passive cooling techniques are closely coupled to the thermal comfort of the occupants. It is conjointly potential to extend the effectiveness of passive cooling with automatically aided heat transfer technique that enhance the natural cooling processes. It maintains a fragile balance between the human ought to improve lifestyles and feeling of well-being on one hand, and protective natural resources and ecosystems, on that we tend to and future generations rely.

INTRODUCTION

Passive cooling features a holistic approach. As a result of it integrates the building style, material choice and techniques of construction to scale back the heating of the building or to extend the cooling, taking into cognizance the meteorology of the realm, ratio, wind direction and radiation to make conservative buildings. It is the cooling with none variety of energy input, apart from renewable energy sources. Passive cooling techniques are closely coupled to the thermal comfort of the occupants. It is conjointly potential to extend the effectiveness of passive cooling with automatically aided heat transfer technique that enhance the natural cooling processes. It maintains a fragile balance between the human ought to improve lifestyles and feeling of well-being on one hand, and protective natural resources and ecosystems, on that we tend to and future generations rely.

An introduction of a courtyard is often an alternative to take care of the interior climate of a building. It is outlined as an indoor space enclosed by a building or wall and receptive the sky. It is in an open house at intervals a cluster or urban material, curtilage fulfills numerous functions, social, leisure and maintains the microclimate of an area. The increasing urbanization has disconnected individuals from being connected to nature and thus we tend to solely see engineered mass and no open house for interaction in peoples' home. They currently wish a part wherever they will relax and live a top quality life at the same time creating them interact with nature. So a good designing of curtilage could be a remedy for individuals and residences to form them nature friendly.

The thermal comfort are potential only if the person is in equilibrium (no heat is hold on within the body). Buildings area unit to blame for an increasing energy use and gas emissions. Another approach to the approach the buildings area unit designed is required to boost the environmental performance of buildings and minimize their electricity consumption. Curtilage building is one in every of the oldest study forms, that has currently gained importance as individuals modified the ways in which of living.

NEED AND RELEVANCE OF TOPIC

The trendy construction and style techniques of buildings are widely accepted within the region however modern design has not been clearly outlined. Buildings became additional esthetically pleasing however not energy economical. This entails the utilization of excessive energy in cooling. The matter is that in this method there's a disregard for energy potency within the buildings and other people are relying additional on the mechanical cooling systems. There should be application of some passive cooling techniques, however the principles may be applied to supply energy economical buildings. Insulation materials don't seem to be put in on the façade or on the roof that traps the recent air within the building. Most of the building façades are exposed to star radiations that absorb heat throughout the day. This heat is transferred to the inner areas, thereby making thermal discomfort for the building occupants. There is lack of correct flow of air movement at intervals the building. This will increase the unfree heat within the building that will increase the interior temperature. Measures need to applied to scale back the excessive heat within the building so reducing the mechanical masses that are used for cooling down the building.

AIM AND OBJECTIVES

The aim is to reduce the use of mechanical cooling systems in the buildings and apply passive cooling techniques and energy efficient systems in the building structure, to maintain the thermal comfort and reduce energy consumption of the building at a high rate.

The main objectives are to:

- Study the climate of the place and make best use of the local climate which can be used to design buildings with proper techniques.
- Reduce the mechanical cooling systems in the building and introduce passive cooling techniques and provide a sustainable design.
- Reduce the maximum solar heat gain in the buildings.
- Preserve the natural resources and ecosystems on which the future generation will depend.
- Improve the lifestyle and the feeling of well-being.
- Know about the best materials which will support in the application of the passive cooling techniques.
- Maintain day and night temperatures through various materials which will be discussed further.

METHODOLOGY

The study area will start from the introduction to the topic, framing the need and relevance of the research area according to the present evolved problems. The proper framing of the aims and objectives considering to the research area will be listed and the further study will be carried keeping in consideration the major points of focus. The literature review and the available data related to the research area and the analysis of the same will help in the process of carrying out the research in proper procedure and focus areas. The inferences drawn from the literature reviews will be helpful. The study of bye laws will further help in the process of application of various techniques.
There are various aspects which affect the application of passive cooling techniques in the building which are as follows:

- Local area climate of the place
- Sun path movement
- Wind direction
- Building envelope and the Number of floors
- Orientation of the building
- Availability of water bodies and green cover or vegetation
- Proportion of openings through doors or windows in the building

When Passive cooling techniques are used for cooling and ventilation of buildings, the first concern is to avoid cooling loads and then comes the cooling down of the building. Firstly, the reduction of Heat Gain through Passive Design will be worked out and then the dissipation of Heat Using Passive Cooling Strategies will be applied to buildings to extract the existing heat captured inside the building.

SCOPE AND LIMITATIONS

The scope of the project is to study and analyze the climatic conditions of the place and make best use of the natural resources which are available and can effectively help in the reduction of energy consumption of the building. The study and selection of materials will play an effective role in the cooling techniques since they too are involved in the reflecting of the solar heat, thereby maintaining the thermal comfort inside the building. The study shall limit to the existing condition of conducting case studies at various places.

CONCLUSION

In a passive cooling style, it is vital that each part of the building ought to either block or reject star heat gain and check out to stay the building cool against the warmth of summer. Passive style depends on the climate of the world and will so be designed consequently. A passive building is commonly the key foundational component of an economical zero energy building. In a very hot and arid climate, most of the energy load is from mechanical systems, thus this load may well be reduced by adding parts to the building, like ventilated shading devices which may considerably scale back energy consumption. This paper shows that shading devices will block star heat and will additionally offer lighting. The availability of correct openings within the building means contemporary air are often distributed equally everywhere.

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REFERENCES

1. www.wikipedia.com
2. www.issuu.com
3. www.researchgate.com
4. www.scribbr.com
5. www.sciencedirect.com
6. GRIHA Website
7. LEED Website
8. IGBC Organization
9. BEE