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SMART CITIES
ENERGY SIMULATION OF HIGH PERFORMANCE GREEN BUILDINGS
FOR ENERGY AND GREEN BUILDING SPECIALISTS
KRISHNAJI PAWAR, LEED AP BD+C,GSAS CGP,ISO 14001:2015,GCP
ENERGY SPECIALIST CURRICULUM

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LIGHTING SIMULATION
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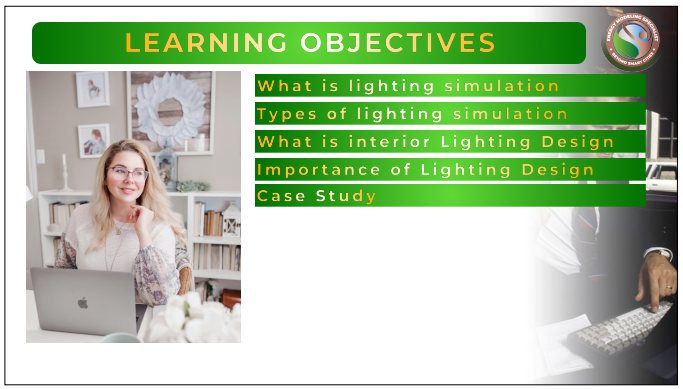

LEARNING OBJECTIVES
What is lighting simulation
Types of lighting simulation
What is interior Lighting Design
Importance of Lighting Design
Case Study

LIGHTING SIMULATION

The lighting analysis feature enables Architects and Designers to visualise the effect of light within their designs. This can be used to simulate the effect of heat caused by the sun's interaction with a design, or to find dark spots in a building, to reduce energy consumption by maximising the use of daylighting.

Daylight analysis : Analysis provides quantitative information (annual available natural light, thermal impacts of natural lighting, solar shading analysis, etc.). Simulation is used to create a qualitative visual interpretation of what the space may actually be like (renderings)

Artificial lighting : Analysis of artificial lighting is to ensure that adverse components of lighting (for example, glare or incorrect color spectrum) are not biasing the design. This also helps in energy saving, choosing luminaires and spacing between these fixtures.

WHAT IS INTERIOR LIGHTING DESIGN?

Lighting simulation has become an essential component of interior lighting design. It enables the creative design of lighting solutions via the use of light simulator software.

Using technological light simulator software, our lighting advisors are able to consider options such as tubular daylighting devices (TDD), translucent walling solutions, centralied lighting control systems, implementation of glazing materials and skylights to help increase the efficiency of your building's interior lighting design.

Energy efficient lighting planning should be an integral element of the interior design of any building. Striking the right balance between ambiance, purpose and green energy use, our lighting advisors can combine your building's lighting needs with sustainable options by utilising your building's natural light sources.

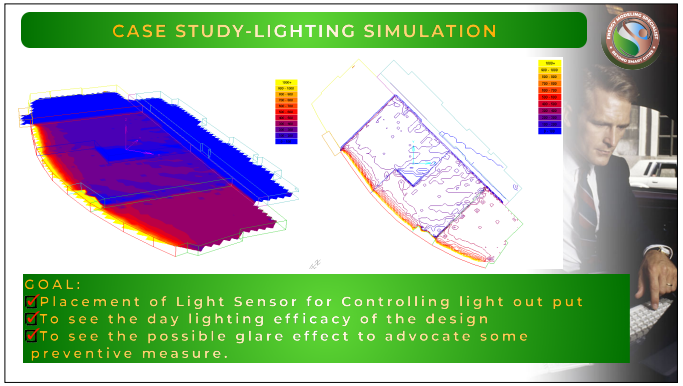
Using complex computer software, it is possible to create an accurate model of how light will intersect with and be consumed by future building projects. By capitalising on the natural light resources available to you, you can reduce your reliance on artificial light sources which in turn decreases your costs where energy consumption is concerned. This can have a huge impact on your environmental footprint and your profit margins. As compared to conventional design practices, optimising the use of natural lighting can condense energy costs up to 60%. This can be achieved by adopting various building envelope design strategies through the creation of a lighting plan to obtain a careful balance of heat gain and loss, glare control and visual quality.

THE IMPORTANCE OF LIGHTING SIMULATION

Value-driven design which is a systems engineering strategy, was the main perspective through which the design process was looked at throughout this study. As such, lighting simulation was investigated from a systems engineering perspective in the context of lighting design.

The lighting conditions under which will operate the building users represent a key-aspect for the interior environmental quality. The sustainability protocols currently in-use try to increase the use natural illumination because, apart from the eventual energy savings, the artificial light has a much lower frequency compared with the sun light and therefore it turn out being non-optimum for the human eye perception.

In order to guarantee optimum lighting conditions, even during the early design stage it is important to develop a simulation of the natural and artificial lighting conditions which could help us identifying possible weak points where light lacks or exceeds. On the other side, lighting simulation allows us to evaluate the efficiency of shading devices and their effects on lighting conditions


CASE STUDY-LIGHTING SIMULATION
GOAL:
Placement of Light Sensor for Controlling light out put
To see the day lighting efficacy of the design
To see the possible glare effect to advocate some preventive measure.

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