Archana A P
Doctoral Research Scholar (BTCM Division)
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Current status

Doctoral research scholar at BTCM Division, Department of Civil Engineering, Indian Institute of Technology, Madras under QIP scheme.

Research Area

Day lighting, Heat transfer, Light-reflecting Materials, Optimization

Experience

Research and Teaching

Assistant Professor at Department of Architecture, Rajiv Gandhi Institute of Technology, Kottayam since 2014.

Lecturer at MES College of Engineering, Kuttippuram, Malappuram -2005 to 2006

Professional

Junior Architect at JKMDC architects, Kottayam - 2011 to 2013

Junior Architect at Thomas Panicker and Varghese Architects, Trivandrum - 2007 to 2010

Education

Year	Degree/University	Specialization	CGPA/ percentage
2018	Master of Technology, IIT Madras	Building Technology and Construction Management	9.37
2011	PGDTA , Mahatma Gandhi University	Traditional Kerala Architecture	68 %
2004	B. Arch, Kerala University	Architecture	70%

Academic Research work

1.Daylight and thermal performance of light shelves in buildings

(Ongoing)

- *Ph.D. work under the guidance of* Dr. Benny Raphael, *Professor, Indian Institute of Technology Madras, Chennai, India*

Integrated day lighting strategies are more energy efficient and several researches prove that better quality of light can be produced through these strategies. Simple and cost-effective daylight redirecting devices like light shelves have gained due importance in building design. Light shelves are plane horizontal or inclined elements placed above a window, either internally or externally, to control and redistribute incoming daylight through reflection. Light shelves help in uniform distribution of daylight deeper into the room. It is easier to control daylight quantity by altering the surface finish of the light shelf as well as the ceiling of the room from where the daylight undergoes a second reflection and redirects the light into the work plane. Light shelf ensures better daylight quality in tropical buildings when designed and placed based on design of room. There are studies regarding low and high transmittance glass for glare free uniform daylight. Length, height, geometry and angle of light shelf, height of window, slope and surface properties of ceiling, interior surface properties, sun and sky conditions of site are the parameters that decide daylight quantity and quality from light shelves. The control of heat generated from the lighting system needs to be studied for better thermal comfort.

2. Evaluating the performance of a hydronic radiant cooling system on exterior walls.

Hydronic radiant cooling has the potential to reduce the energy required for achieving acceptable thermal conditions. The feasibility of using a hydronic radiant cooling system embedded within exterior walls, along with a cooling tower for cooling water, under hot and humid climatic conditions were studied. Simulations are conducted with EnergyPlus v8.7 tool to analyze the energy efficiency of the system. The results reveal a cooling load reduction of 11% to 52% with varying thermal properties and set point temperatures. The system has a payback period of 4.2 years under Indian conditions.

Professional affiliations

Member, Council of Architecture (CoA)

Member, Indian Institute of architects.(IIA)

Accredited Professional, Indian Green Building Council.(IGBC)

Reference

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