



K.S. SCHOOL OF ENGINEERING AND MANAGEMENT
Mallasandra, Off. Kanakapura Road, Bengaluru-560109
Phone: 08028425012/013 website: www.kssem.edu.in
DEPARTMENT OF CIVIL ENGINEERING

SOCIALLY RELATED PROJECTS (2022-23)

Experimental Study on Sustainable Thermal Blocks for Trombe Walls to Condition Buildings

Sustainable construction is the use of environmentally friendly materials to construct, operate, and maintain building structures. It reduces the consumption of electricity for heating and cooling buildings, creates a healthy indoor environment, and also makes use of recycled materials in its construction. Sustainable construction is crucial for creating a more sustainable future and reducing the carbon footprint of buildings, which is a major contributor to global greenhouse gas emissions. A trombe wall is a simple wall in which air gap is created in the wall, which decreases the heat transfer from outside to inside or vice versa. The brick or block used to construct the trombe wall is known as thermal block.

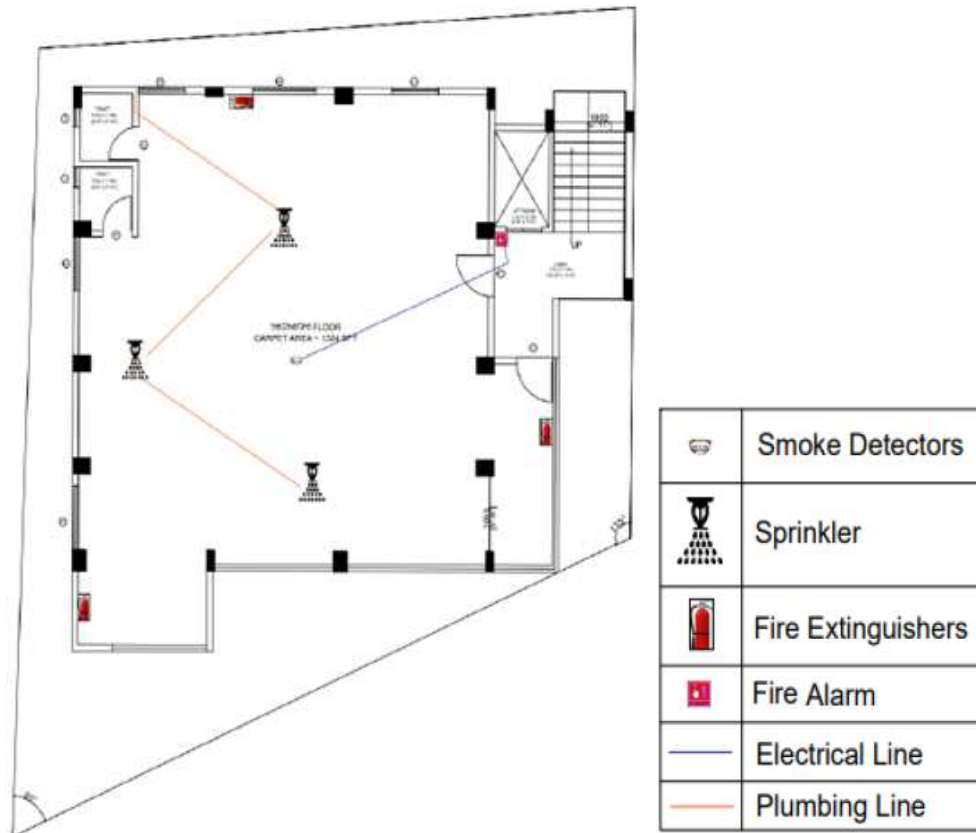


Trombe Wall Construction

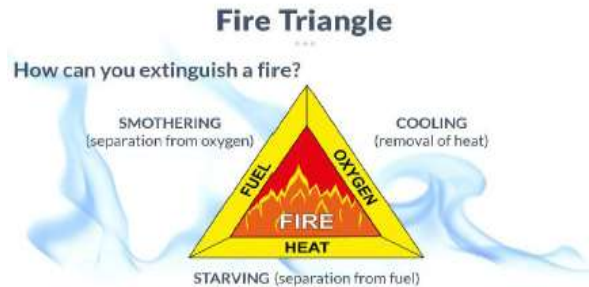
In this project, modified thermal blocks of size 340mmx140mmx195 mm were implanted with plastic water bottles filled with water. The blocks were manufactured using cement mortar in the ratio 1:5. Thermocouples were inserted into the blocks and connected to a thermocouple reader to measure the variation in temperature between the outside and inside surfaces of the block, when exposed to sunlight. The thermal blocks were then cured for a period of 7 days. A room of size 1 x 1 x 1 m constructed and exposed to outdoor climate conditions. An infrared thermometer is used to note the surface temperature difference between the two sides of the wall. This adaptation of modified thermal block in the construction of a trombe wall reduced the indoor temperature during hot days while also adding sustainable benefits such as energy efficiency and reduced carbon footprint to condition the building.

Fire Safety Audit for Multi-Storey Buildings

Due to the development of technology and materials, Engineers are able to build taller and bigger structures. Also, with the advancement in the provision of mechanical and electrical facilities such as, lifts, heat, ventilation and air-conditioning systems, the risk of fire has also increased. In India alone, about 18,450 fire incidents were reported in 2019. Around 17,700 people were killed and about 1,193 injured. In view of this, stakeholders' responsibility is to prevent such incidents and mitigate losses. This study focuses mainly on fire protection and safety of multi-storey buildings.



Fire safety layout plan of commercial buildings



In this study, the public buildings such as educational building, hostel building and mercantile buildings were selected for fire risk assessment. National Building code and other standards were followed for this study and a check-list was prepared before carrying out site inspection. During site inspection, existing fire protection system was checked and noted for any deviations or non-compliance with the National Building Code (NBC) and other Standards of Practice. Recommendations were made to prevent or reduce the fire risk. Drawings were also prepared for the proposed recommendations including active fire protection systems such as smoke detectors, fire alarm, hose reels and sprinkler system.