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TABLE OF CONTENTS

TABLE OF CONTENTS

GLOBAL CHALLENGES AND URBAN INFRASTRUCTURE

Ar.Indira Kolli M.Arch
Principal

The major threats of Human Habitation

Exploitation of Natural resources and manmade.

1.Rivers , canals, Lakes,

2.Green and Open spaces.

1. Rivers , Lakes ,canals.

Rivers:

As per Indian (Hindu)Mythology Rivers are considered as sacred. Rivers were(and are) life giving resources for many of our ancient cities, like Nile River, Indus River and Tigris and Euphrates rivers. Rivers had a significant role from begening.Tere are nine important rivers in India. There are nine important rivers of India and they are: The Ganges, Yamuna (a tributary of Ganges), Brahmaputra, Mahanadi, Narmada, Godavari, Tapti, Krishna, and Kaveri.Allmost all are contaminated. Without water there is no life. Now it is a great threat for many cities , towns, villages and human habitation ,by disappearance of rivers.

Lakes:

Since ancient time's lakes have been providing water for domestic and irrigation purposes, also people celebrate religious rituals at rivers and lakes. there are two types of lakes one is common and other is religious , which are connected with temples. Lakes are also traditionally significant. now lake water being used for industrial use and irrigation purposes. Now lakes are also evaporating and contaminated.

Canals:

Canal is a human-made waterway that allows boats and ships to pass from one body of water to another. Canals are also used to transport water for irrigation and other human uses.

These rivers, lakes and canals are once they were very isolated. Little away from human habitation. In case of Nile and Indus settlements and human habitation were along the rivers and they had Avery good water supply and drainage system. Laws were implemented very strictly. Also public were more systematic and obedient to the law and system.

Major Rivers in India

Nile Settlement

Indus valley settlement

Husain Segar Lake once

Sutlej Yamuna Link Canal

Musi river earlier days

Existing condition of Musi

Husain Segar lake at present

Source of images Google. This article will be continued in October Month

SINGAMPATTI PALACE
A cultural identity of a Zamin settlement

Ar.Chinnadurai.S M.Arch

Head Of The Department

History:

Said to be Descendents of Ancient Tamil King Pandya, Singampatti Samasthanam has records from 1100A.D, In the reign of Oograhapandya, about the year 1100 A.D., one Apadodharana Thevar of the country of Sethupathees left his native place and sought fortune in the South. Apadp-dharana Thevar formed kingdom with the help of Rajah Kalitha Pandya. This principality had been an independent kingdom which was transformed in the 1530s into a Palayam/Poligar by the Nayaks and then converted to Zamindari in 1806 by the British.

Notable events of Singampatti Zamin:

In this era of Kings without Kingdom and Kingdoms without Kings, still the love of Singampatti people towards the Ex-Zamindar and rich heritage is still intact, which can be seen in singampatti palace and Kings Dharbar Event of Aadi festival of Sorimuthu Ayanar temple. The Fifth King of Singampatti helped Raja kalitha Pandya to succeed War should be between 1200 -1300.

The palace was constructed in four phases in four different eras and each phase follows a distinct form of architecture. The portion built in the first phase is influenced by the Kerala style of architecture, given the affinity of Uthukuli with north Kerala. Since the region receives five months of rainfall, the roofs are low and slanted.

THE ALLIANZ ARENA, MUNICH – ILLUMINATED FACADE

The first Stadium with a completeColour changing exterior

Ar.Raghavendran.M, M.Arch
Assistant Professor

The Allianz Arena is a football stadium in Munich, with a 75,000 seating capacity. Widely known for its exterior of inflated ETFE plastic panels.It is the first stadium in the world with a full colour changing exterior. The stadium is designed so that the main entrance to the stadium would be from an elevated esplanade separated from the parking space consisting of Europe's biggest underground car park.The external architecture of Allianz Arena is made up of 2,874 diamond metal panels of ETFE (ethylene-tetrafluoroethylene copolymer) at a pressure of 35 hPa. Each panel can be illuminated in white, red or blue. The intention is to illuminate the panels to match with the colors of the respective local team, or white when the local German team plays.The roof of the stadium has built-in roller blinds which may be drawn back and forth during games to provide protection from the sun.Later, this innovative stadium-facade lighting concept has been subsequently adopted in other arenas too. It evolves such luminosity that the stadium can easily be spotted even from a distance of 80 km.There are little dots on the panels. When viewed from far away, the eye combines the dots and sees white. The foil has a thickness of 0.2 mm, each panel can be independently lit with white, red, or blue light.The panels are lit for each game with the colours of the respective home team. White is also used when the stadium is a neutral venue. Other colours or multicolour or interchanging lighting schemes are theoretically possible, but Munich Police strongly insists on uni-colour only due to several car accidents.

RESIDENTIAL LANDSCAPE – FRONTYARD & BACKYARD

Ar.M.Priyadarshini M.Arch
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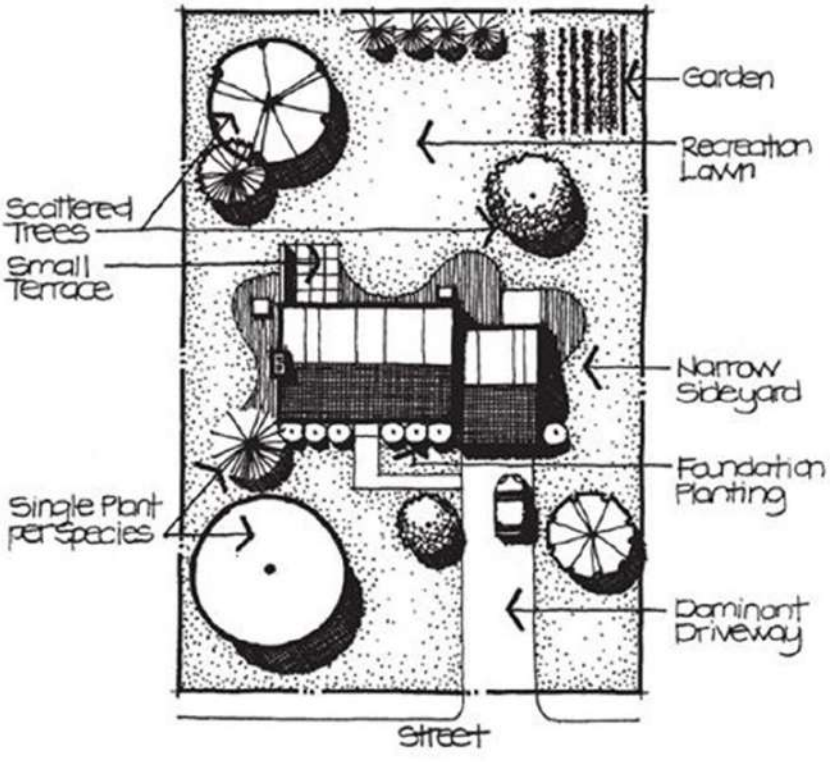
Frontyard:

The front yard is most often thought of as a public setting for the house. A lawn, often manicured to create a lush green carpet, occupies most of this area with a driveway situated along one side of the site. In arid areas of the country, the lawn area may be replaced with gravel or decomposed granite. The front yard is often dotted with trees, shading various parts of the yard. Typically, a row of plants extends along the entire base of the house. This foundation planting often consists only of coniferous or broad-leaved evergreens that provide a year-round wall of green colour. Finally, a narrow walk extends

Backyard:

The backyard is the most varied area of the typical residential site. In older neighbourhoods, or those found in western states of the country, the backyard is usually enclosed with walls, fences, or plantings. In these situations, the backyard is apt to be the most private area on the site. In newer neighborhoods, especially in the eastern and midwestern regions of the country, the backyard is often very open, with little or no definition of where one property ends and another begins. In these conditions, there is little privacy in the backyard. On most residential sites, the backyard is a more utilitarian area than the front yard and is the location of the outdoor terrace, work space, garden, and open lawn for recreation. It is usually the location for outdoor living activities. On other sites, the backyard provides little or no use to the residents; it is just leftover outdoor space that must be maintained. Also, in most houses backyard is used to grow vegetables and other plants used in cookery



BAMBOO ARCHITECTURE – A SUSTAINABLE WAY OF CONSTRUCTION

Ms.ArAshika P, M Arch
Assistant Professor

Bamboo is a woody grass plant which has a hollow stem that grows in the tropics. They are a very fast growing plant. They require low maintenance cost therefore making them a perfect building material. It can be used as a natural composite material in various construction applications. Bamboo has a compressive strength greater than brick and concrete as well as tensile strength comparable to steel. Earlier bamboo was used only by the poor and it was not a premium building material. But now it is being used in all types of architectural construction. Since bamboo is easily renewable and an inexpensive resource it is being cultivated in many countries. The application of bamboo is not just restricted to framed structures. It is being used in facades, interiors, modern houses, restaurants, resorts and many others which are both elegant and sustainable.

Advantages of using bamboo are they are easy to cut; they are non-polluting, light building materials, can be used for temporary and permanent construction, earthquake resistant and do not require painting.

Sharma Springs – Indonesia (IBUKU)

Bangkok Hair Salon – Thailand (NKDW Studio)

KontumIndochine Café (VoTrongNghia Architects)

Blooming Bamboo Home (H&P Architects)

URBAN GROWTH

Ar.R.Reya, M.Plan
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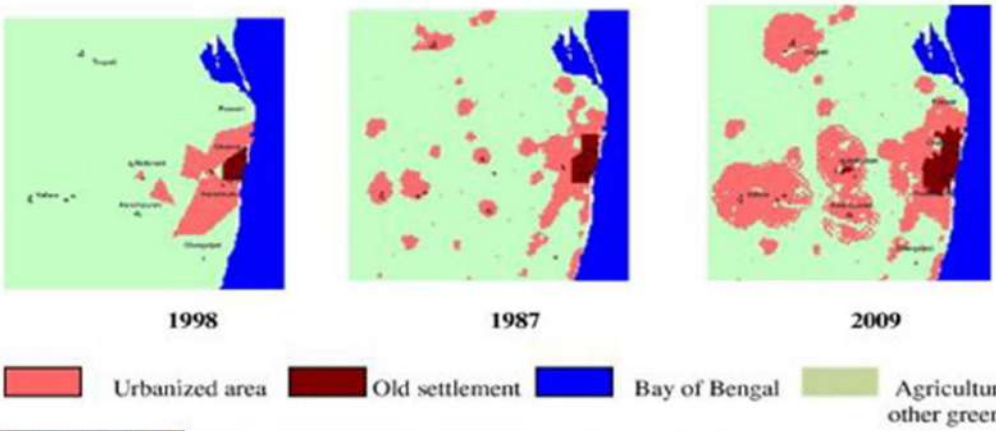
Urban Growth is the process of increase in population density and thereby increases in the built-up density of any urban area. Urban Growth is usually characterized by the expansion of urban limits in its surrounding. The main cause for Urban Growth is the Migration of people from surrounding rural context to urban context; this phenomenon is known as Urbanization. Urban Growth can be viewed as a positive as well as Negative factor in the history of the development of the human settlement. High job opportunities, better standard of living, easy supply of municipality services, etc are few positive impacts of urban growth. Environmental degradation, Transformation of farmland to the built-up land, overcrowding, pollution, etcare few negative impacts of Urban Growth. Urban growth is measured in terms of percentage as Urban Growth rate. In India, Surat is said to have the fastest-growing 9.2 % average growth rate. Cities like Mumbai, Chennai, Delhi, Bangalore, Hyderabad has higher growth rate when compared to other cities.

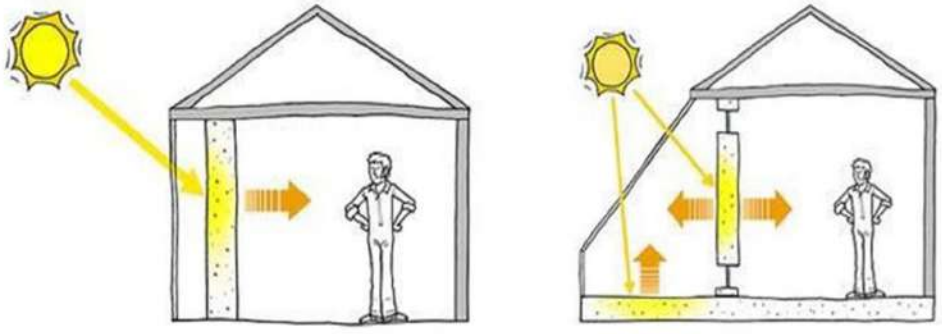


TROMBE WALL

Ar.Ajila Shiny R S, M.Arch
Assistant Professor

A Trombe wall is made from materials having heat storage capacities like bricks concrete or composites of the block, brick, and sand, thus it is referred to as a thermal storage wall, mass wall and solar wall. The external surface of the wall is placed directly behind the glazing with an air gap in between and painted as black to increase its absorptivity. Solar radiation is absorbed by the blackened surface and is stored as sensible heat within the wall. In an unvented wall, the stored heat slowly migrates to the inside, where it heats the adjacent living space. Throughout the night, the wall can provide adequate heat to the living space if properly designed. Some of the warmth generated within the air space between the glazing and therefore the storage wall is lost back to the surface through the glass.

In a vented system, the circulation of hot air and the quantity of warmth available for storage by the Trombe wall can be reduced. This stored heat is, however, not readily available for immediate use, instead, it's transferred slowly into the living area. Hence, unvented Trombe walls are provided for residences, which require heating mainly during the night. Furthermore, in cold climates where daytime also as night-time heating requirements are high, it's desirable to supply a particular amount of warmth onto the living room. The thicker wall absorbs and stores more heat to use at night, the efficiency of the wall increases as the conductivity and thickness of the wall increase.

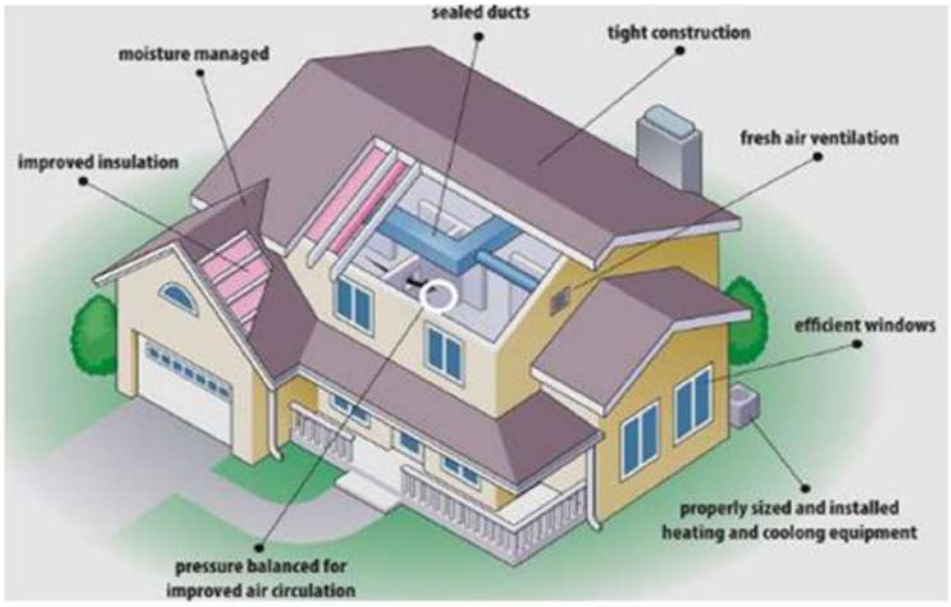


ENERGY-EFFICIENT HOME DESIGN

Er.E.M. Jerin Shibu M.E,
Assistant Professor

Before design a new home or remodel an existing one, consider investing in energy efficiency, so that we can save energy and money, and the home will be more comfortable and durable. The planning process is also a good time to look into a renewable energy system that can provide electricity, water heating, or space heating and cooling.

In an existing house, the first step is to conduct a home energy assessment (sometimes referred to as an energy audit) to find out how the home uses energy and determine the best ways to cut energy use and costs.



Solar Tempering

Solar tempering provides a cost-effective alternative that involves taking advantage of solar heat gain without increasing window area or cost. It works best when the common living areas and most windows face south. Optimal shading lets in winter warmth and excludes summer heat. Solar tempering provides added light and warmth to the living areas and may reduce heating costs by 10% to 20% without added expense and without risk of overheating in summer

Install Energy Efficient Lighting

Use natural light as much as possible by strategically placing windows in living areas. To the extent possible, all the daily living spaces should be south-facing. The south-facing wall should contain the majority of the windows. If necessary, natural light can be spread throughout the house by using transoms, glass block and other indoor windows where cost effective. Minimizing energy use for lighting, while optimizing light for residents, is an important feature of zero energy homes. LED lights are the perfect match for these tasks. They are more energy efficient than CFLs, last many years longer, and contain no mercury. In addition, they can meet a variety of lighting needs from very bright white light to soft, warm light. Selecting the right LED lights for the task, locating lights strategically, and utilizing natural light as effectively as possible can drastically reduce a home's energy use.

Use Highly Insulated Windows and Doors

Windows and doors are like big energy holes in a well insulated, airtight building envelope and are the third most cost-effective opportunity for making a home energy efficient. Control window and door heat loss and gain by selecting appropriate window and door products, carefully locating them, and optimizing their size and orientation.

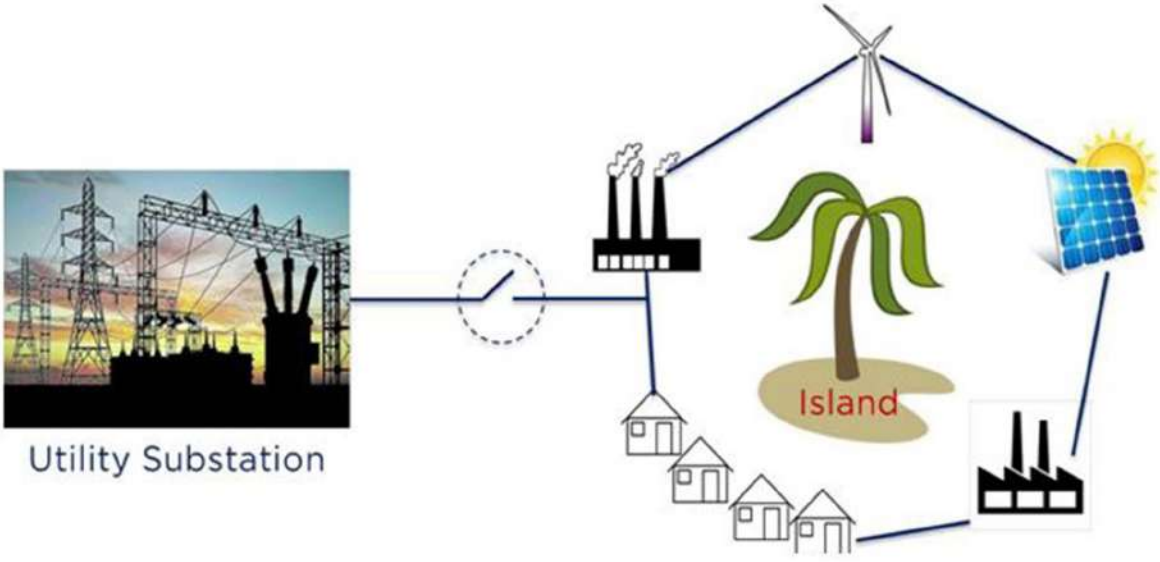
Create an Energy Efficient, Fresh Air Supply

Since zero energy homes are so airtight, a continuous source of fresh filtered air and moisture control are critical to its success. This need for ventilation has a silver lining: zero energy homes are healthier and more comfortable than standard homes. Highly energy efficient ventilation systems, known as heat recovery ventilation (HRV) systems or energy recovery ventilation (ERV) systems expel stale air while recovering its heat and returning that same heat to the home with the fresh air.

POWER SYSTEM ISLANDING

Er.E.M. Jenner M.E,
Assistant Professor

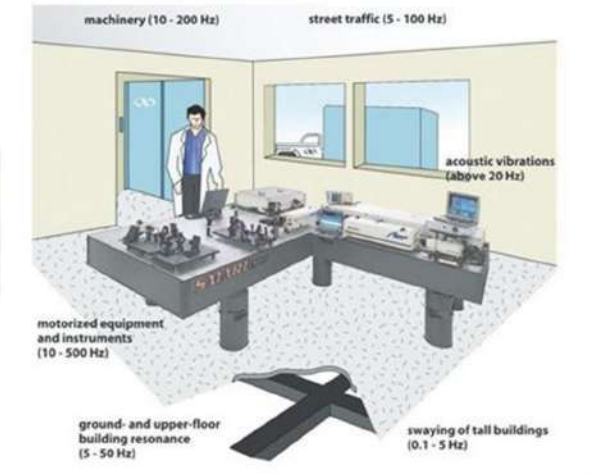
The Power system islanding comes to a point where there is the integration of distributed generation (DG) such as a DC Microgrid, Solar power with the power grid. The grid does not supply any voltage when it is operating in islanding mode and the power is still distributed from the Distributed generation systems. Although there are huge challenges with the integration of renewable energy with the grid, in the case of electricity the Power system islanding may be different. Islanding mode can be intentional or unintentional. In the case of a small grid system during the Grid failure, the controllers on the small grid act in such a way that it itself disconnects the grid and allows the DG to supply power to the load. The huge advantage of power system Islanding is that power supply is not stopped even during the Grid disturbance and also the Restoration of the island is faster when compared to restoration of the whole system from black out state.



STRUCUTAL VIBRATION CONTROL

Er.Relin Geo.R M.E,
Assistant Professor

There are 3 basic strategies to cut back dynamic response of a structure: reducing the bottom motion by shifting the first frequencies, increasing damping within the structure, or avoiding resonance state. By victimization base-isolation systems, the energy and motion cannot transfer to the structure. Application of those systems ar sensible to some form of structures and thus, management devices ar developed to use an impact force, to utilize the energy absorption, or to avoid resonance. For seismal response management of systems, adding damping to a large-scale structure is additional sensible than ever-changing mass and stiffness. Varied force-generating devices ar needed to come up with the restoring force, however with abundant less effort, an impact system will add damping to the system. Passive management systems use passive energy dissipation devices, to provide the management force. The properties of those devices don't seem to be adjustable to the environmental changes and thus they're less flexible to completely different load patterns.



Vibration control System

LIVEABLE GREEN NETWORK

Ar.T.Josephine Sabeena B.Arch
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INTRODUCTION

The Liveable Green Network is a part of the City's plans to make the local area as green, global and connected as possible. It aims to create a pedestrian and cycling network that connects people with the city and village centres as well as major transport and entertainment hubs, cultural precincts, parks and open spaces. It is important that residents, workers and visitors are able to walk and cycle around a city as large and diverse as Sydney. Many global cities have cycling and pedestrian networks with a focus on recreation and leisure, which often frame parklands, foreshores and other scenic attractions. Extensive cycling paths have already been put in place. More cycleway projects are currently being constructed or designed. The City is working towards building a 200km cycling network including 55km of separated cycleways.

WALK, RUN,CYCLE

Routes laid out for the Liveable Green Network will encourage cycling and walking. Improvements will include separated cycleways, lower speed limits, widened footpaths and improved crossings. Cycling routes will be clearly marked with easy-to-read maps and signage. More seats, bubblers and bike parking will be built along major cycling paths.

BUILDING PERFORMANCE SIMULATION SOFTWARE

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Simulation is a process of generating real time process or report through a computer program. The computer programs created to serve this purpose are termed as simulation software.

Building Performance simulation software is used to find the building's lighting performance, heat transformation, acoustic performance, wind analysis, Thermal Comfort analysis and so on. There is different simulation software in practice. Software available in the industry and there uses are listed below:

Si. No	Software Name	Logo	Uses
1	Insight Plugin for Revit	AUTODESK INSIGHT	Natural Lighting Analysis, luminance Analysis.
2	Energy Plus		Over all Building Energy Analysis, Thermal Comfort Analysis, can be used for Optimization
3	Open Studio		Over all Building Energy Analysis, can be used for Optimization
4	equest	eQUEST	Over all Building Energy Analysis, can be used for Optimization
5	COMSOL Multiphysics	COMSOL	Acoustic simulation
6	Simscale	SIMSCALE	performance, optimize durability, and improve efficiency

PYTHAGOREAN THEOREM

Ms.R.Maria Anushiya M.Sc
Assistant Professor

Pythagoras theorem states that the square of the hypotenuse is equal to the sum of the square of the other two sides. The Pythagorean Theorem is a statement in geometry that shows the connection between the lengths of the edges of a right triangle – a triangle with one 90-degree angle. This application is often utilized in architecture, woodworking, or other physical construction projects. It is used often in construction, in engineering, in architecture, in design, in art and in astronautics. Especially Architects use this theorem, which is expressed by the equation a2+b2 = c2, in planning and computing the measurements of building structures and bridges.The foremost obvious application of the Pythagorean theorem is in the world of architecture and building construction, particularly in respect to triangular- formed roofs. The theorem applies only when dealing with right angles with a 900 angle. Also it is used in navigation, cartography, Finding angles of elevation and depression. Navigation issues area unit usually solved victimization this theorem.

TRADITIONAL PASSIVE STRATEGIES IN REDUCING CARBON EMISSION

Ar.GnanaShini G, B.Arch
Tutor

In the context of the worldwide concern for heating and a necessity for reduced carbon emissions, increased energy potency, reduced waste and wish for various sources of energy; traditional passive techniques offer a high degree of comfort for a extended part of the day whereas minimizing energy use.

Orientation and urban form: The urban form in modern designing is set by the economic standing and high rises are finding preference as against the normal layouts. Yet, considering the advantages of orientating to scale back insulation and increase wind movement in designing ought to be thought of by designers.

Typology: The shortage of house and therefore the westernized style trend have steered designers far from adapting the courtyard in house design, in conjunction with the changes in lifestyles of individuals. The box-like style makes the modern house deeper than may be expeditiously serviceable by natural ventilation.

Shading/Latticework windows: Jalli windows create a definite aesthetic expression however are a priority for safety and pester-er management in conjunction with being valuable in each time and money. Instead, the employment of louvers/blinds and tinted or heat-reflective windows rather than clear float glass windows will facilitate in increasing the potency of the windows.

Stack effect openings/wind towers: Modern design usually ignores the principles of fenestration style for ventilation, specializing in providing giant glazed areas for visual aesthetics. The normal principles used for increasing the wind movement in indoor areas may be expeditiously tailored to this context, by providing high level trickle vents or atrium areas with ventilators. The employment of wind towers is discouraged conjointly because of aesthetic considerations however a well-designed wind tower will augment the aesthetic expression and supply an economical thanks to cool buildings.

Roof design: The employment of double roofs is an economical approach of reducing heat gains and may simply be incorporated in modern design. The employment of material pots for insulation in traditional homes also can be tailored in modern design to scale back heat gains.

Materials: Within the hot and arid zone, the serious thermal mass of the walls and therefore the roofs of the normal house provides long thermal lag ideal for a climate with high diurnal vary, keeping the house snug each within the day and therefore the night whereas within the hot and wet zone, the high thermal mass of the walls provides some thermal lag whereas the skinny roof permits the house to chill apace within the evenings to keep up comfort conditions.

URBAN FLOOD - CHENNAI

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Urban Flood refers to flooding in urban area when the rainfall overwhelms the capacity of drainage systems. This is one of the major disaster faced by Chennai in recent times. Topographically Chennai has a plain terrain with few isolated hillocks in the southwest. The city has seen several catastrophic flooding in past century caused by heavy rain associated with cyclonic activity.

There are four major lakes that serves water for the Chennai city. The most majestic lake among this is that the Chembarambakkam Lake cover a ground area of 3800 acres, the sudden opening of this lake into the Adyar river is the one that caused this major flooding history.

The major causes of urban flood is due to global climate change, urbanization, improper and inadequate drainage systems, encroachments on river banks and so on. The storm water drainage shouldn't be a matter because Chennai is uniquely blessed with an excellent natural drainage system with three rivers (Adyar, Coovum, Kosasthalaiyar) and a man-made Buckingham canal. But the rivers lost its water carrying capacity. Hence, these rivers must be rejuvenated to control flood in further years.

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