

CONSTRUCTION INFRASTRUCTURE ARCHITECT WORLD

CRAFTING THE CONSTRUCTION INDUSTRY IN WORDS



The true meaning of sustainability lies in its perfect harmony with nature, amalgamating basic design principles as well as innovative technology – making it ‘Smart yet Sustainable.’

GREEN BUILDING AND SUSTAINABILITY



V Suresh,
Chairman of CII's Indian Green Building Council

“IGBC rating systems are also designed to address National priorities and are aligned with various National codes and regulations.”

Gurmit Singh,
National Vice Chairman, IGBC

“IGBC closely works with several Central and State Government agencies to promote the green building movement in the country.”



CHENNAI AIRPORT,
CHENNAI



GREEN BUILDING AND SUSTAINABILITY

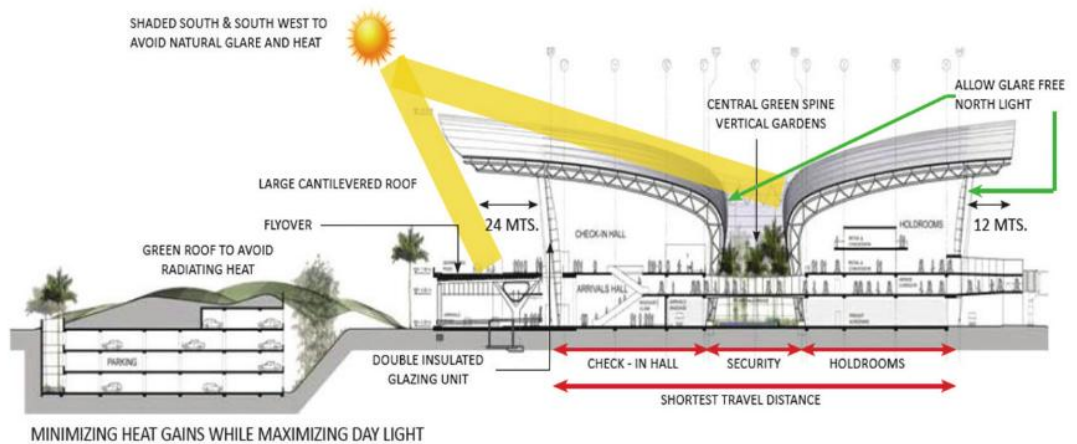
PROF. CHARANJIT SHAH AND
AR. GURPREET SHAH

The foremost criteria to develop a sustainable building is to understand the features of the site like topography, vegetation, climate, sunlight, wind pattern and the availability of materials and resources.

To promote sustainability there is a conscious need to understand the available resources at hand and developing the built form using strategies which make it sensitive to the environment and its context. The foremost criteria to develop a sustainable building is to understand the features of the site like topography, vegetation, climate, sunlight, wind pattern and the availability of materials and resources. Employing this basic information to simulate the orientation, envelope and the configuration of the building is enough to make the building much more environment friendly.

At Creative Group, our ideology towards every project has been to treat the building as a living organism rather than a dead mass of brick and concrete, thus focusing on making it breathe with nature. Employing the use of passive strategies of climate, the sun and the wind and optimizing the built form based on these parameters has helped us to design structures which truly symbolize the

VERTICAL GARDENS WITHIN THE TERMINAL BUILDING - CHENNAI AIRPORT, CHENNAI



USE OF ACTIVE AND PASSIVE DESIGN STRATEGIES IN DESIGN - CHENNAI AIRPORT, CHENNAI



“HIGH LEVEL OF SUSTAINABILITY IN NEARLY EVERY ASPECT OF DESIGN, INCLUDING RESTORATION OF THE NATIVE LANDSCAPE, PASSIVE ENERGY CONSERVATION STRATEGIES, MATERIAL SELECTION, ON-SITE STORM WATER DETENTION, AND ON SITE WASTE WATER TREATMENT AND DISPERSAL SYSTEMS IS BEING AIMED AT. ADHERENCE TO ACTIVE AND PASSIVE STRATEGIES ARE FOLLOWED STRICTLY. BRICKS HAVE BEEN REPLACED WITH AAC BLOCKS (AERATED AUTOCLAVED CONCRETE BLOCKS), WHICH ENSURES THERMAL INSULATION. BESIDES INSULATING CAPABILITY, AACs CAN BE EASILY INSTALLED WITHOUT ANY KIND OF DAMAGE.”

PROF. CHARANJIT SHAH ON THE DESIGN OF CHENNAI AIRPORT



TIMES SQUARE MALL, NAYA RAIPUR

The orientation of the building was decided based on the solar movement ensuring shade from the South and the South west, while maximizing the daylight from the North and minimising the heat gain.



L TO R - USING TRADITIONAL JAALI AS A SUNSHADE DEVICE, USE OF PERGOLAS (INDIAN HABITAT CENTRE BY JOSEPH ALLEN STEIN)

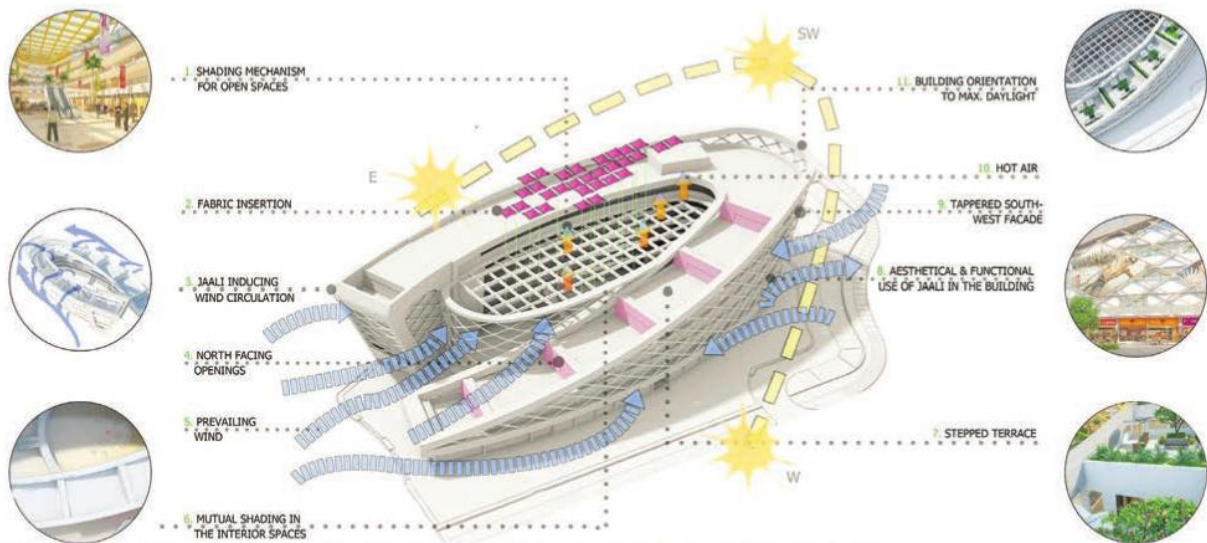
meaning of 'green'.

Taking forward the approach that - 'Airports should not be energy guzzlers', Chennai Airport, is designed as one of Asia's largest green terminal. The orientation of the building was decided based on the solar movement ensuring shade from the South and the South west, while maximizing the daylight from the North and minimising the heat gain. The building form also creates a central green spine with vertical gardens, breathing life into the otherwise mega structure.

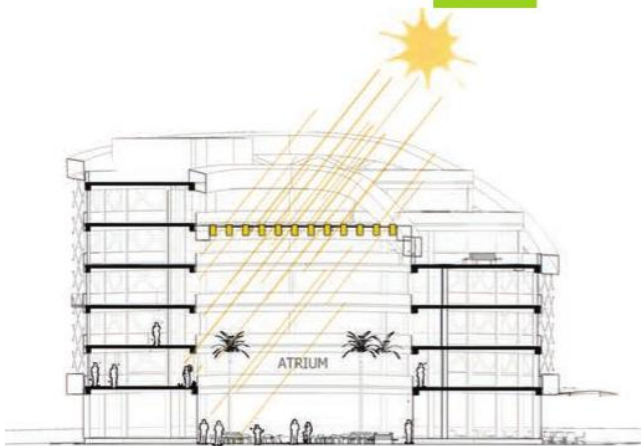
The aim was to implement various passive and active green measures and making the use of best available resources. Waste water



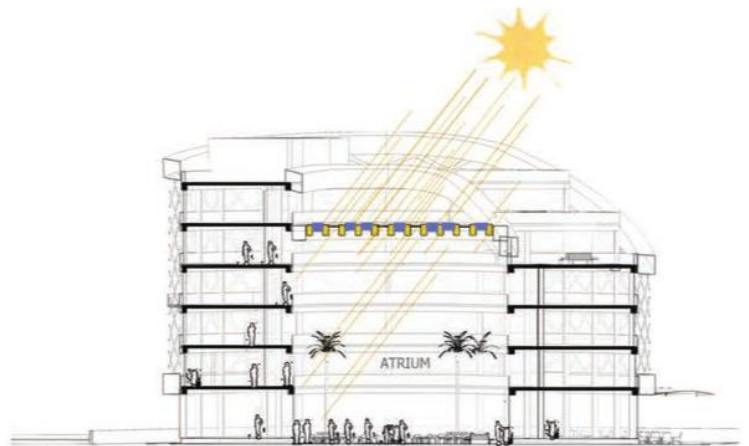
THE NARROW STREETS OF JAISALMER ENABLE MUTUAL SHADING EFFECT



OPTIMISATION OF BUILT FORM BASED ON SUN'S MOVEMENT - TIMES SQUARE MALL, NAYA RAIPUR



DIRECT SUNLIGHT INFILTRATING THE PERGOLA



LESS INFILTRATION OF LIGHT BY THE USE OF FABRIC

CENTRAL COURTYARD PERMITS DAYLIGHT AND VENTILATION - TIMES SQUARE MALL, NAYA RAIPUR



is being treated on the site itself and simultaneously used for irrigation and recycled as flush water, while the storm water is retained by using green pavers with high porosity. Along with this and the adoption of a solid treatment plant, the total water consumption has been reduced by 40%, thus making the terminal building highly efficient.

Another important lesson for sustainability is the interpretation of traditional knowledge systems in a modern context. Man, since time immemorial, has developed structures responding to the local context, and we as designers should understand the principles inherent in them.

Such was the approach while designing the Times Square Mall in Naya Raipur - creating a commercial complex which was affordable by employing basic designing principles of mutual shading and orientation so that there is minimum consumption of energy. There is no artificial cooling system employed in the building, thereby making it one of a kind commercial building fully based on natural ventilation.

The building form has been inspired from the traditional jaali, developing it to create an elevation which changes at every viewing angle. Stimulated based on the movement of the sun with highest point of the building on the south west, it gives rise to curvilinear form which seems to originate from the sur-

MINIMIZING THE HEAT GAIN AND MAXIMISING THE DAYLIGHT, MASDAR INSTITUTE, ABU DHABI



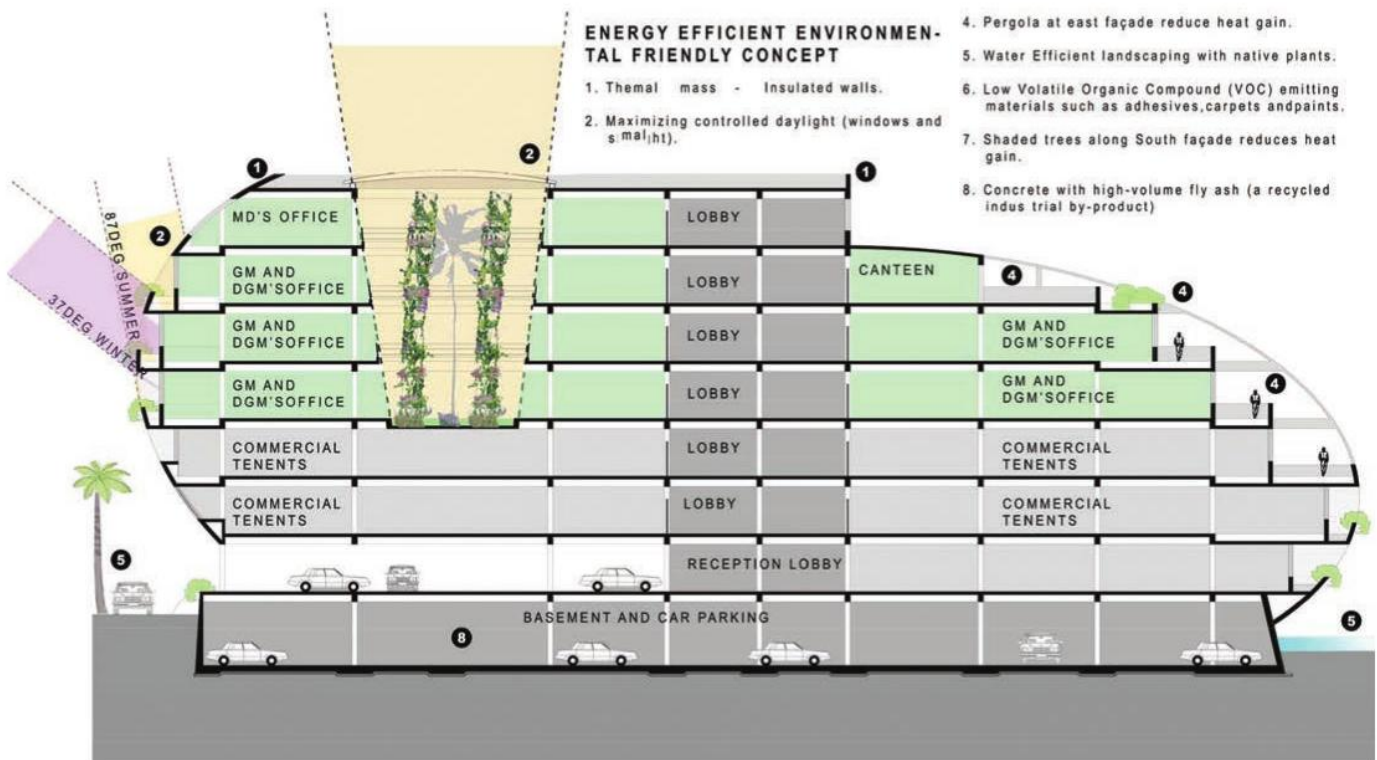
BUILDING INTERNAL AIR CIRCULATION

There is no artificial cooling system employed in the building, thereby making it one of a kind commercial building fully based on natural ventilation.

ENERGY EFFICIENT ENVIRONMENTAL FRIENDLY CONCEPT

1. Thermal mass - Insulated walls.
2. Maximizing controlled daylight (windows and skylights).

4. Pergola at east façade reduce heat gain.
5. Water Efficient landscaping with native plants.
6. Low Volatile Organic Compound (VOC) emitting materials such as adhesives, carpets and paints.
7. Shaded trees along South façade reduces heat gain.
8. Concrete with high-volume fly ash (a recycled industrial by-product)



USE OF PASSIVE DESIGN STRATEGIES - SUGUNA POULTRY HEAD OFFICE, TAMIL NADU



rounding landscape. The central open space and the shaded courtyards create engaging open spaces for interaction and help in channelizing the wind creating a cooling effect throughout the building. The mall also has stepped terraces which give it an interesting design profile and to provide recreational areas for the office spaces. In today's degraded environmental condition, the need of the hour is not to make the building just energy efficient but also emboldening it to an extent of a carbon neutral footprint. This objective can be achieved by minimizing the consumption of resources and energy and follow an integrated approach to make the building self – sustainable, thus establishing equilib-

rium for a NET ZERO building.

Using materials which increase the thermal mass of the envelope like AAC blocks used in the Chennai Airport, or combination of solid aluminium composite panels with stone cladding, and energy efficient glass used in Suguna Poultry Head Office, help in decreasing the heat gain in the building. In the Suguna Poultry Head Office too, the building form in shape of egg shaped geometry is punctured with deep recesses duly coordinated with the sun's movement.

Coupled with these strategies, the integrated approach towards Net Zero is to refurbish the energy using various combination of non-renewable energy generation



Today, we have to take up the challenge to move beyond net zero – develop buildings and infrastructure which not only reduces the carbon footprint of the building but also tries to contribute to make the environment better, thus moving towards a more modern, comfortable and energy – efficient living.

technologies like solar photovoltaic system and wind turbines installed on-site of an appropriate scale. Intelligent building system installed for HVAC, lighting and controls helps in cutting down the energy consumption and the cost, making the building affordable during its lifecycle.

The management of the waste is also a very important criterion to make the building sustainable. Grey water treatment using Solid waste treatment plants and using the water for landscape irrigation, flushing and HVAC are necessary for efficient resource management especially in today's time when water is at the brink of being scarce.

All the strategies and the projects that we have undertaken have aimed at fulfilling the objective of developing Net Zero buildings. Today, we have to take up the challenge to move beyond net zero – develop buildings and infrastructure which not only reduces the carbon footprint of the building but also tries to contribute to make the environment better, thus moving towards a more modern, comfortable and energy – efficient living.



CREATING OPEN GREEN BREATHING SPACES WITHIN THE HUMAN INTERFACE OF LIVING RAPIDLY HELPS IN THE ENERGY CONSERVATION AND THEREFORE REDUCES THE CARBON FOOTPRINT AND DEVELOPS A NET-ZERO ENVIRONMENT.”

AR. GURPREET SHAH