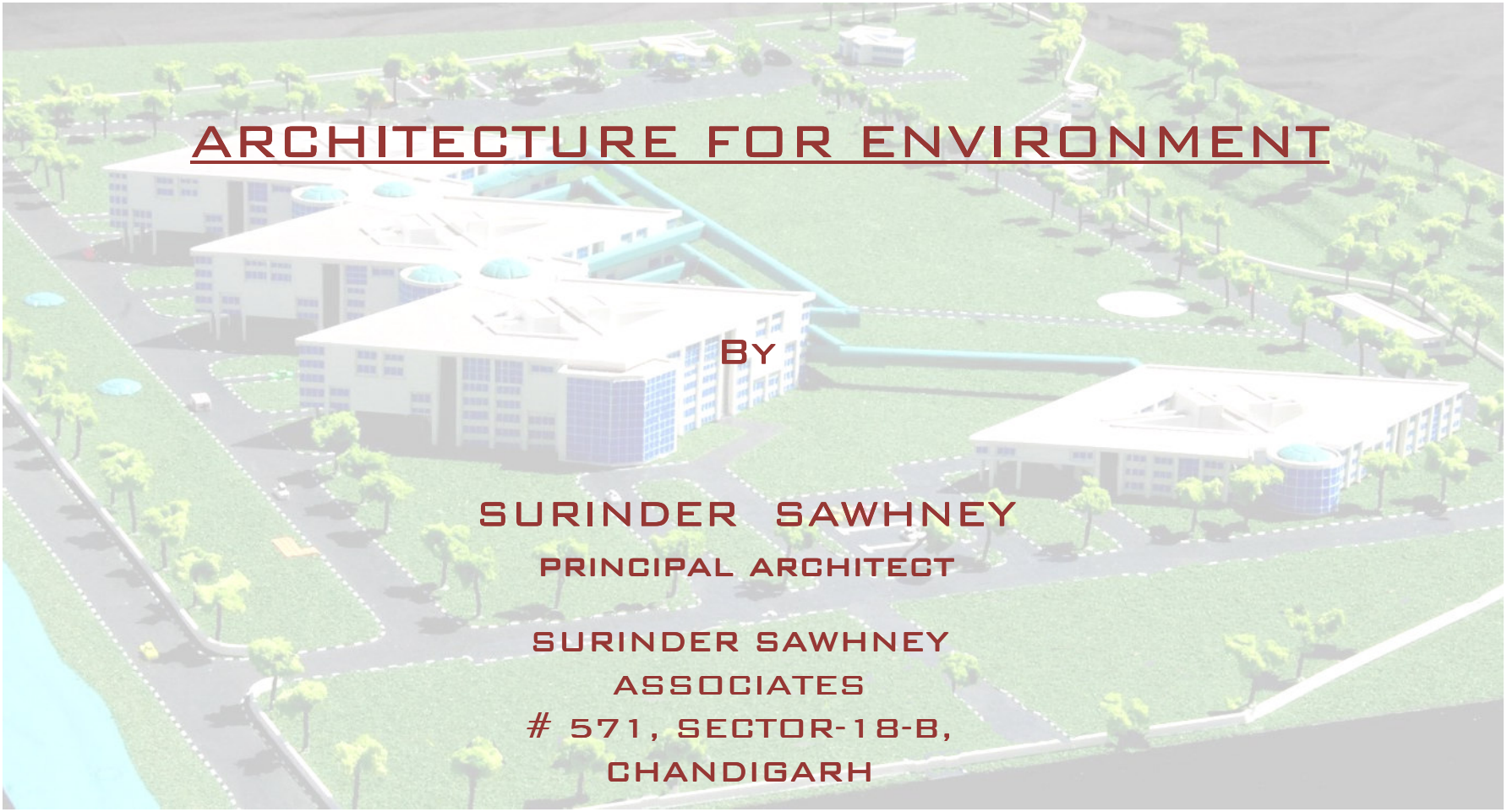


ARCHITECTURE FOR ENVIRONMENT

By

SURINDER SAWHNEY

PRINCIPAL ARCHITECT

SURINDER SAWHNEY
ASSOCIATES
571, SECTOR-18-B,
CHANDIGARH

WE START BY ASKING QUESTIONS ?

WHAT IS THE SIGNIFICANCE OF TIME, SPACE AND CONTEXT IN A ENVIRONMENTALLY SUSTAINABLE DESIGN?

WHAT ARE THE TANGIBLE BUILDING ELEMENTS THAT EFFECT THE PERFORMANCE OF THE BUILDINGS?

WHAT ARE THE INTANGIBLE ELEMENTS THAT ENHANCE THE EXPERIENCE OF A BUILDING ?

WHAT IS THE SHELF LIFE OF A SUSTAINABLE PRODUCT I.E. HOW LONG SHOULD THE PRODUCT FUNCTION AND BE RELEVANT?

SHOULD SUSTAINABLE BUILDINGS AND PRODUCTS BE DESIGNED ONLY FOR PERFORMANCE?

THUS THIS PRESENTATION IS ABOUT

SUSTAINABILITY FOR THE ENTIRE LIFECYCLE OF A PRODUCT

GOOD SUSTAINABLE DESIGN BUILT INTO AND NOT DRAPED ON

ADOPTING PRINCIPLES OF BIO CLIMATIC ARCHITECTURE

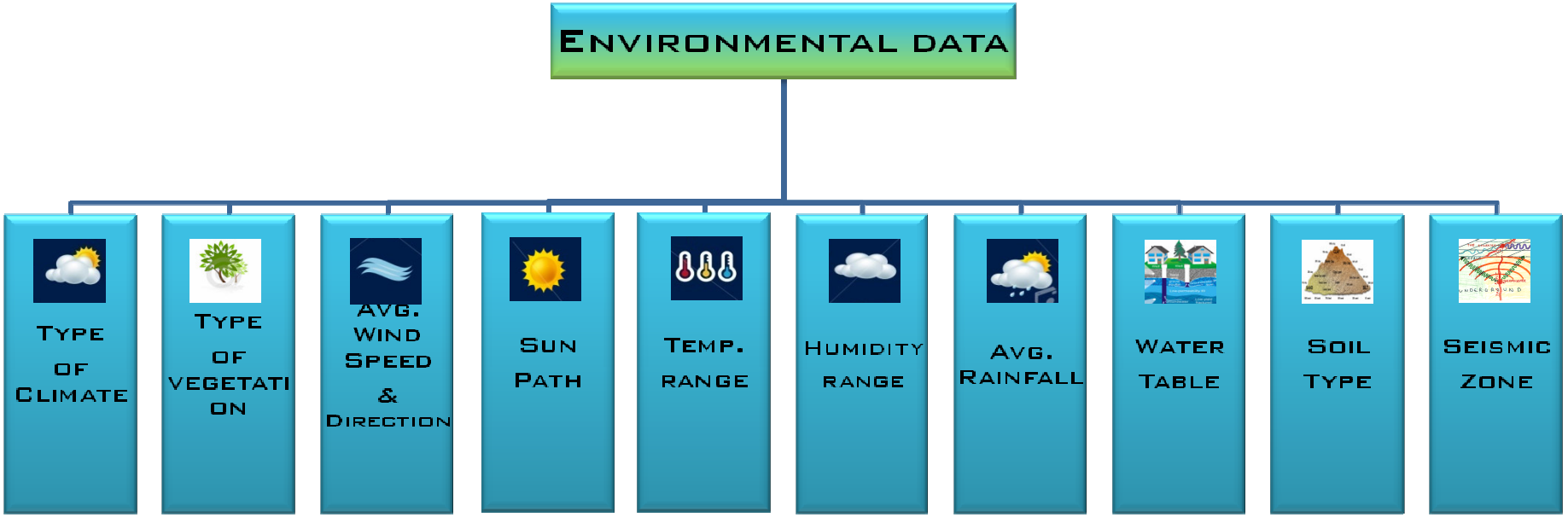
ALONG WITH APPROPRIATE RESPONSE TOWARDS

ENVIRONMENTAL, SOCIAL & ECONOMIC NEEDS OF SOCIETY

BIO-CLIMATIC DESIGN PRINCIPLES

THUS THE FOCUS IS ON DESIGNING SPACES IN BUILDINGS, CAMPUSES & TOWNSHIPS ON BIO-CLIMATIC DESIGN PRINCIPLES BASED ON LOCAL CLIMATE

USING EXTERNAL CONDITIONS FOR INTERNAL CLIMATE CONTROL



THE IMPACT OF ALL NATURAL ELEMENTS ARE OPTIMIZED TO ENSURE COMFORT CONDITIONS IN & AROUND THE BUILDINGS INTEGRATING CLIMATE AND ENERGY WITH APPROPRIATE ARCHITECTURE

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AIR PLANE

ONE OF THE BEST AND MOST COMMON EXAMPLES OF A FUNCTIONAL DESIGN IS THE AIR PLANE – HERE IS A MACHINE THAT IS NOT ONLY DESIGNED FOR EFFICIENT PERFORMANCE BUT IS ALSO A GRACEFUL OBJECT OF BEAUTY

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TATA NANO

EFFICIENCY PAR EXCELLENCE

BUT HOW LONG WOULD THE PRODUCT BE RELEVANT?

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SUSTAINABILITY FOR LIFE

STEPWELLS OF GUJARAT

EXTRA ORDINARY CONTRIBUTION TO ARCHITECTURE

BUILT FROM 11TH TO 16TH CENTURY THESE MAGNIFICIENT STRUCTURES HIGHLIGHTED THE IMPORTANCE OF WATER AND SURVIVED MAJOR EARTHQUAKES.

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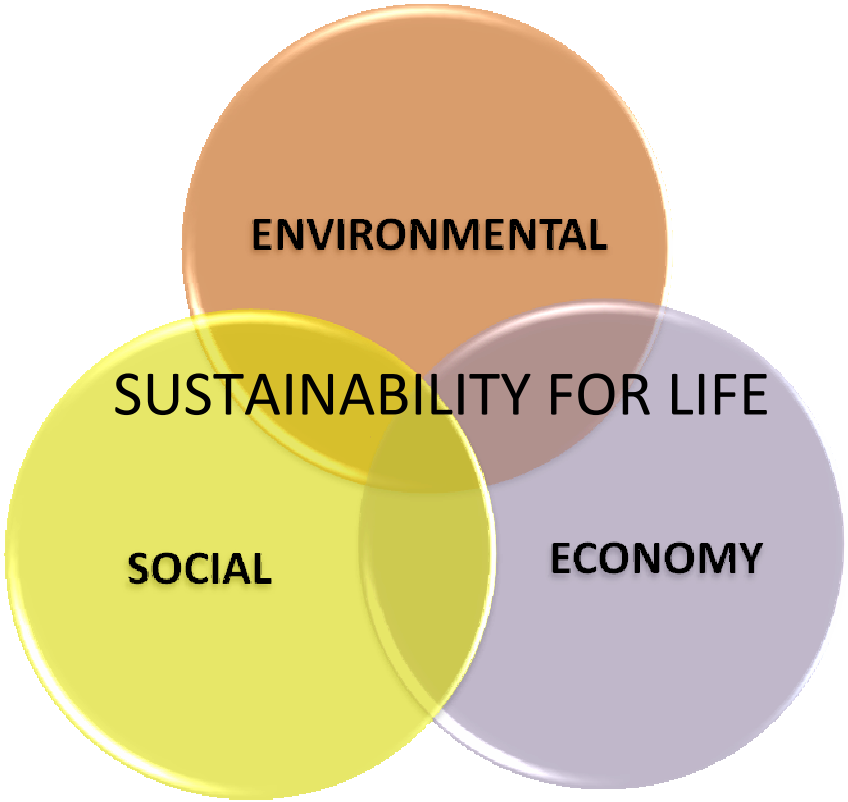

CREATIVE DESIGNS WITH ABSOLUTE FUNCTIONALITY AND RESPONDING TO ECONOMIC, ENVIRONMENTAL & SOCIAL, NEEDS ARE SUSTAINABLE FOR LIFE

ARCHITECTURE FOR ENVIRONMENT

THE MAKING OF AN A.I.I.M.S

INNOVATION AND FUNCTION

Innovation as reflected in Plan & function as in efficient Process flow

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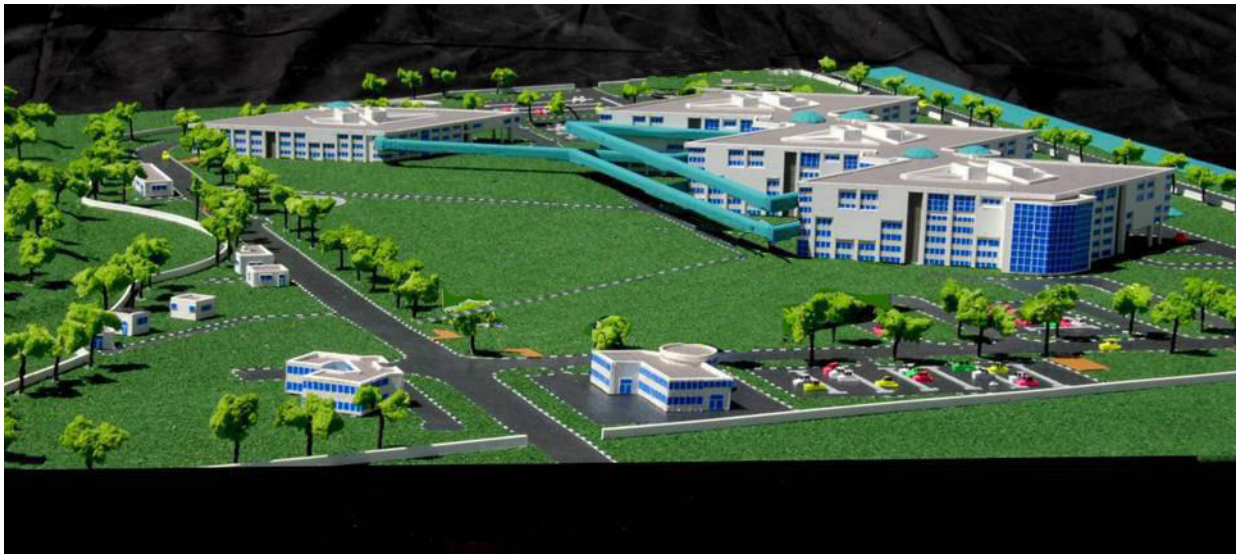
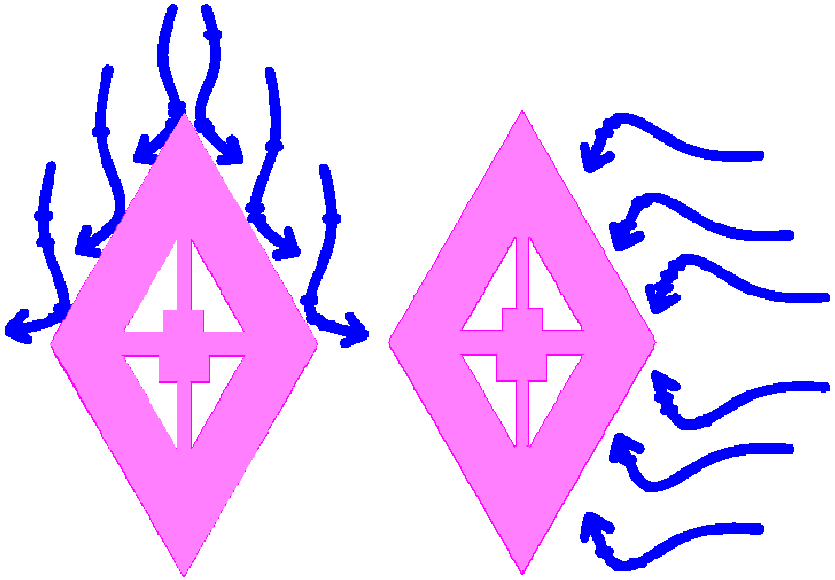
DESIGN HIGHLIGHTS

- Sustainability
- Simplicity
- Functionality
- Cost Effectiveness



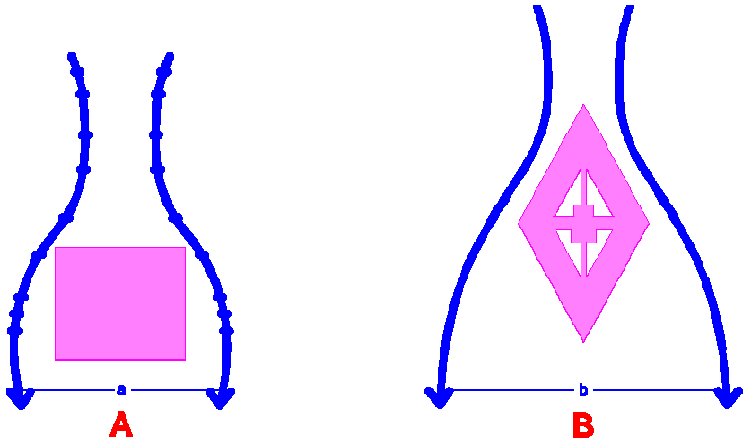
WIND INDUCTION-- APPROPRIATE BUILDING FORM



A STUDY TO SUBSTANTIATE THE SAME WAS CARRIED OUT BY GIVONI PROVING THAT A WIND INCIDENCE AT 45° WOULD INCREASE THE AVERAGE INDOOR AIR VELOCITY AND WOULD PROVIDE A BETTER DISTRIBUTION OF AIR MOVEMENT.

THIS ORIENTATION COMBINED WITH THE INTERNAL COURTYARDS INDUCE GOOD NATURAL VENTILATION OF THE ROOMS AND COOL THE FAÇADE.

- FIGURE A SHOWS THE OUTLINE OF AIR FLOW AT 90° AND FIGURE B AT AN ANGLE,
- IN THE SECOND CASE A GREATER VELOCITY IS CREATED ALONG THE WINDWARD FACES, THEREFORE THE WIND SHADOW WILL BE MUCH BROADER, THE NEGATIVE PRESSURE (THE SUCTION EFFECT) WILL BE INCREASED THUS INCREASING INDOOR AIR FLOW INSIDE THE BUILDING.



CONCEPT OF UNIVERSAL SPACE AND EASY ADAPTABILITY

'A GOOD DESIGN FOR LIFE'

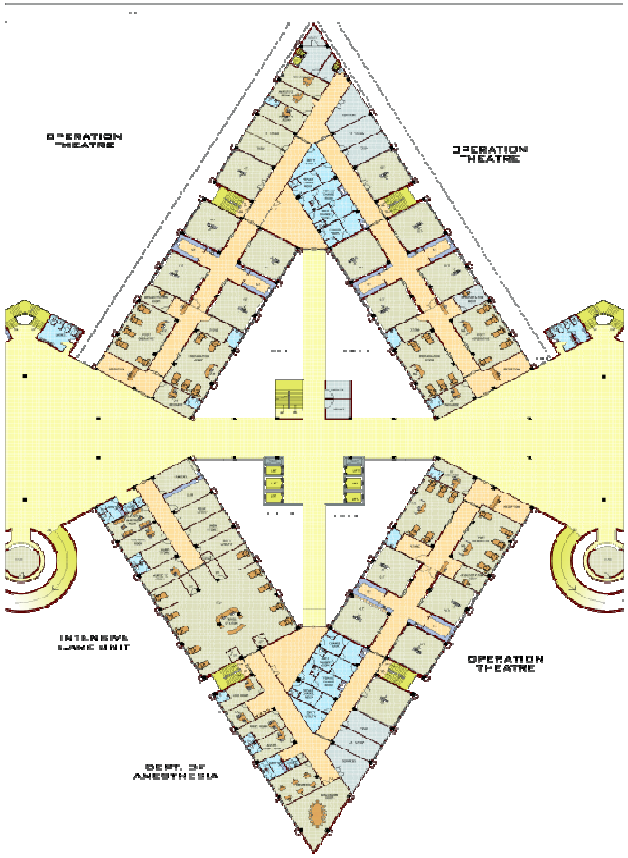
- THE DESIGN MODULE HAS BEEN DEVELOPED ON THE CONCEPT OF UNIVERSAL SPACE.

- THE DESIGN HAS THE EXTRAORDINARY ABILITY TO MODULATE ITSELF AND EASILY ADAPT TO THE EVER CHANGING FUNCTIONAL NEEDS OF THE CLIENT

- REDISTRIBUTION / REDESIGNATION OF ACTIVITIES CAN BE DONE WITH EASE.

- FLOOR PLATE SIZE
- DESIGN MODULE
- SHAPE AND THE COMPOSITION OF ITS ACTIVITY ZONES

ALL CONTRIBUTE TO THE CONCEPT. THUS, CATERING TO IMMEDIATE UP GRADATION OR EXPANSION NEEDS WITHOUT STRUCTURAL CHANGES THUS SHOWING EFFICIENCY.

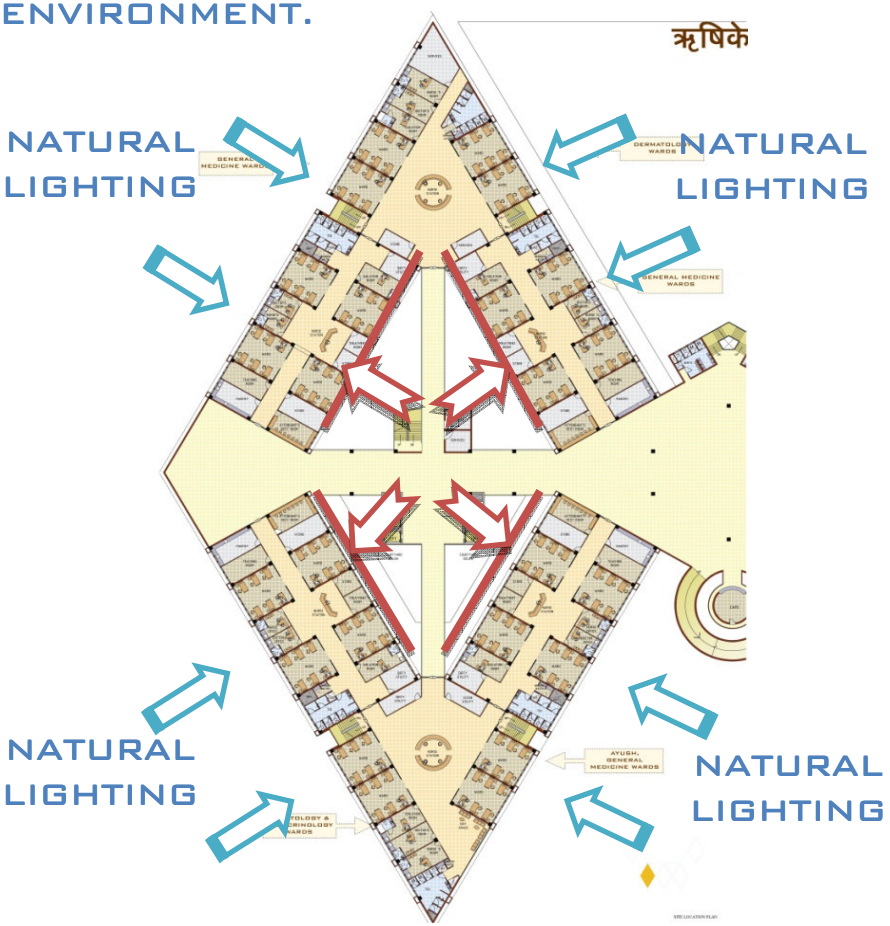


OPERATION THEATRE & I.C.U

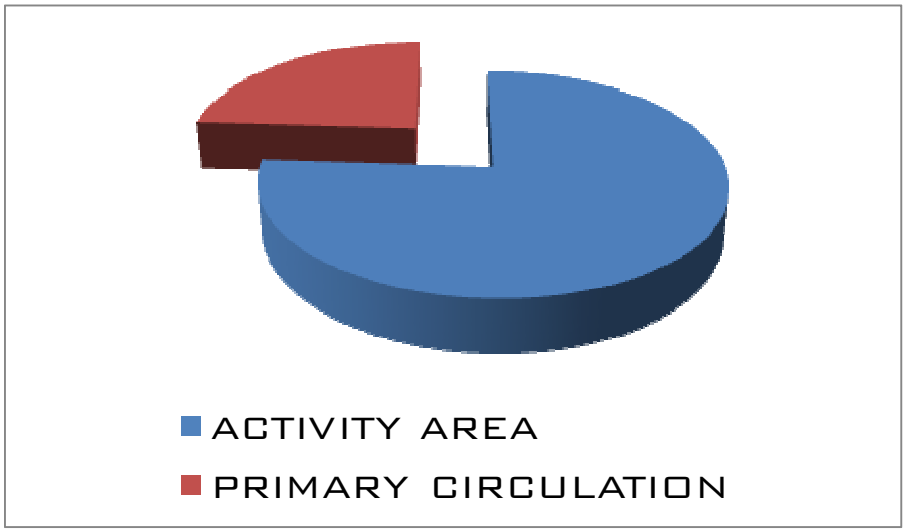
PLAN CONCEPT

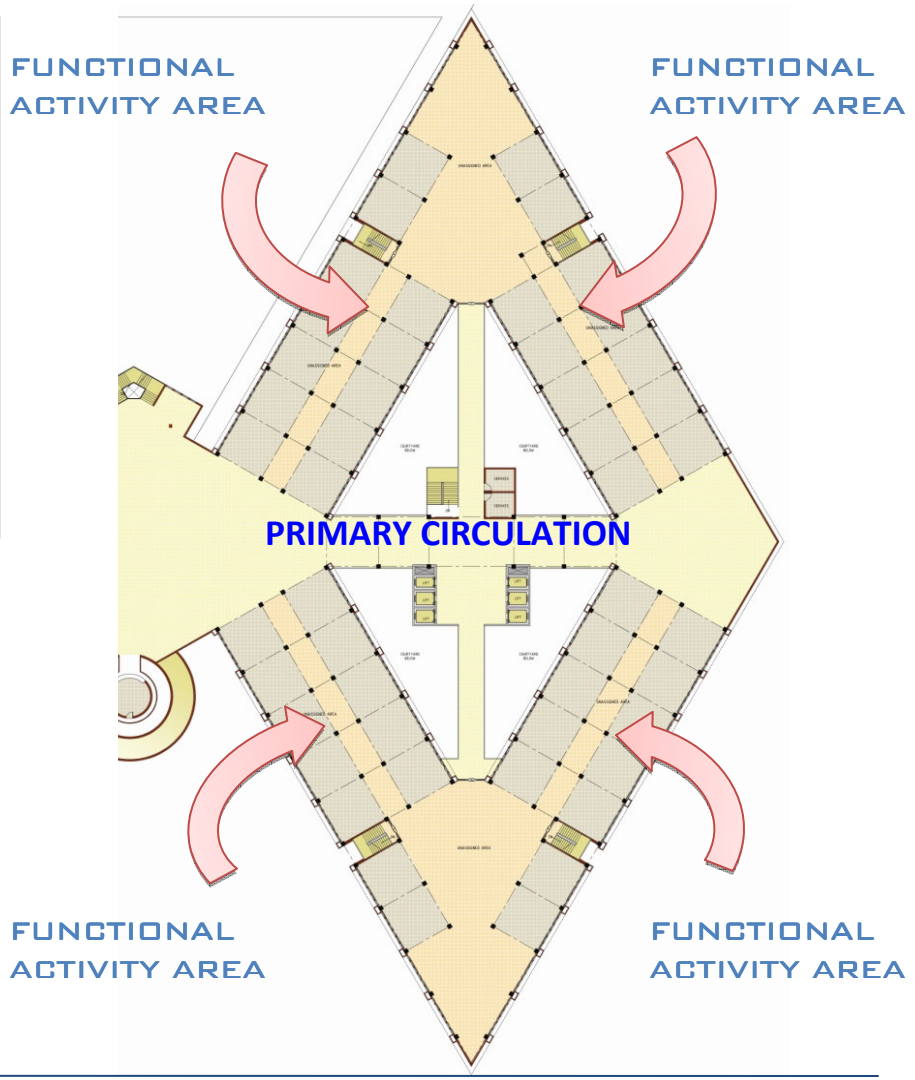
NATURE HEALING AND RESOURCE OPTIMISATION

- ALL ACTIVITY AREAS OF THE HOSPITAL ARE NATURALLY LIT AND VENTILATED WHERE REQUIRED. THUS, SAVING ENERGY AND CREATING A HEALING ENVIRONMENT.



PLAN EFFICIENCY





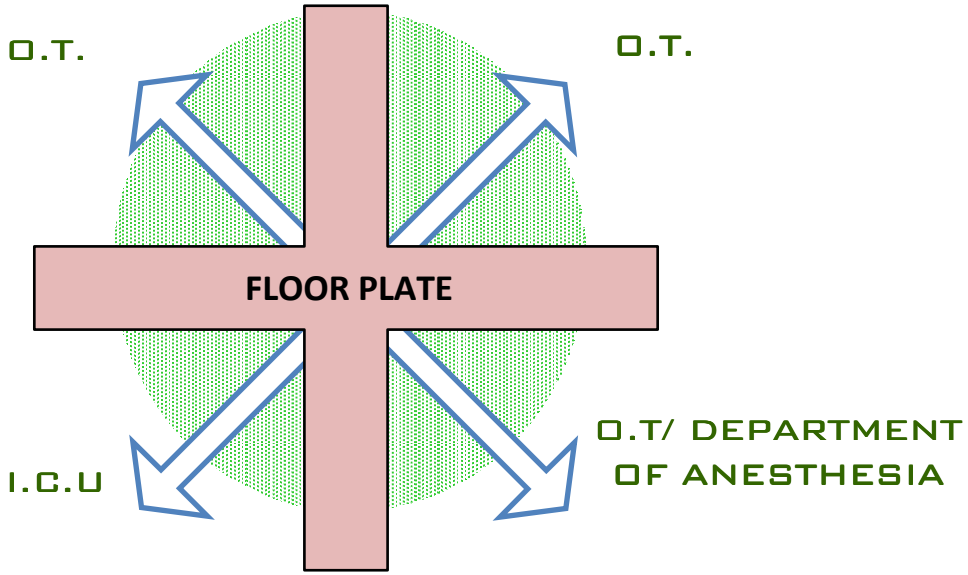
REDUCTION IN CIRCULATION :

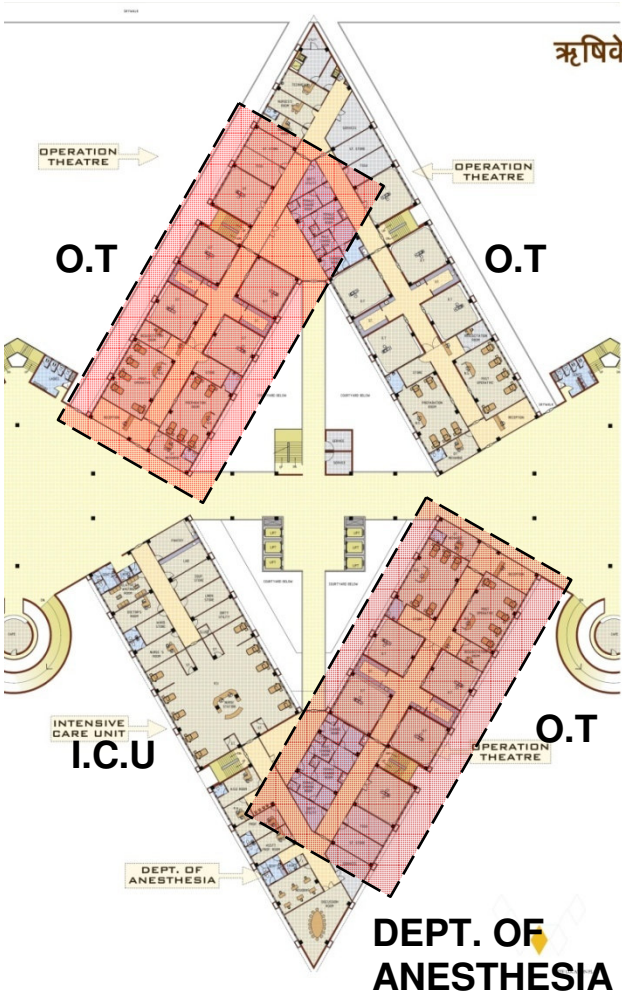
- THIS UNIQUE DESIGN MODEL INCREASES THE FLOOR PLATE EFFICIENCY VIS-À-VIS PRIMARY CIRCULATION TO 76%.
- THUS, ENABLING
  - SHORTER TRAVEL DISTANCES
  - REDUCTION IN COST
  - OVERALL EFFICIENCY

OPERATIONAL EFFICIENCY OF FLOOR PLATE

- THE DIMENSION OF THE FLOOR PLATE HAS THE EXTRAORDINARY ABILITY TO ACCOMMODATE ON A SINGLE FLOOR ALL ACTIVITIES OF A PARTICULAR / ALLIED SPECIALTY.

- THUS, THE O.T'S JUXTAPOSED WITH THE I.C.U & DEPTT. OF ANESTHESIA ON THE FLOOR PLATE ENHANCE THE OPERATIONAL EFFICIENCY.



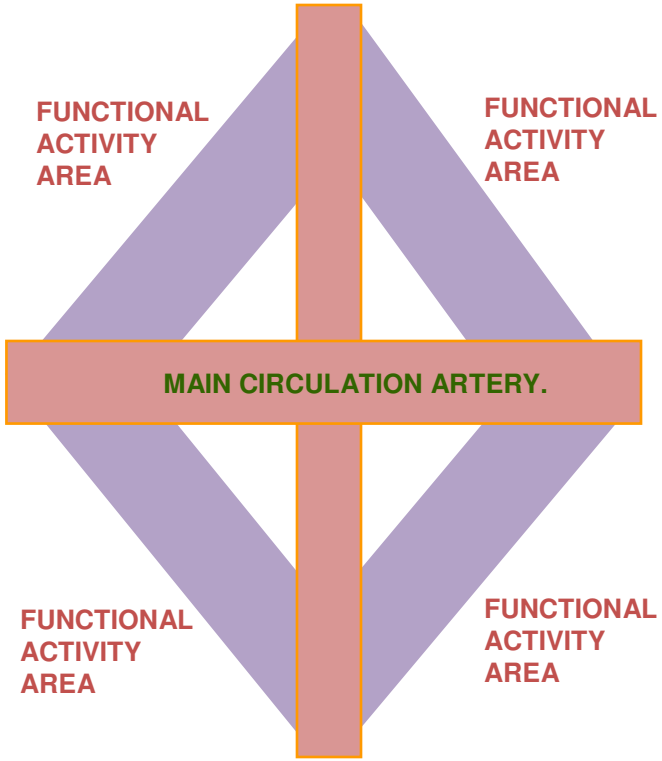


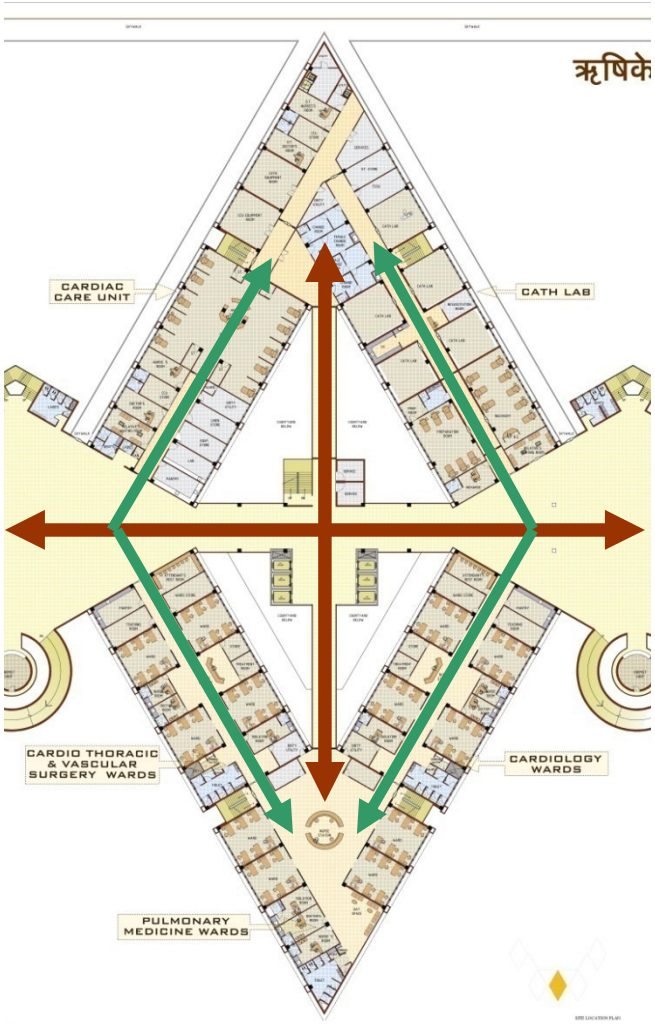
REDUCE STEPS FOR ALL & INCREASE PERFORMANCE

LOAD DISTRIBUTION REGULATION OF TRAFFIC AND DECONGESTION

CIRCULATION

To avoid congestion, separate corridors radiating out from the main circulation artery have been provided to each activity area.

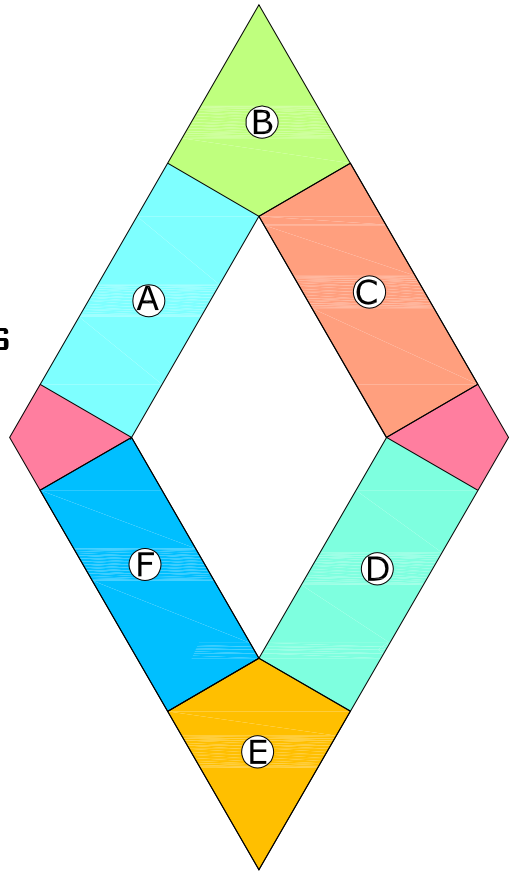




COMFORT ZONE CRITERIA

MICRO CLIMATIC FEATURES

THE MICROCLIMATIC ELEMENTS LIKE THE PROXIMITY TO THE RIVER & THE LANDSCAPING OF THE AREA HAVE BEEN WELL EXPLOITED IN TERMS OF WIND MOVEMENT/SUN CONTROL THROUGH PLAN FORM FOR ENSURING COMFORT CONDITIONS INSIDE THE BUILDING.



SPATIAL SEGREGATION

THE BUILDING HAS BEEN PLANNED IN SUCH A MANNER SO AS TO PERMIT COMPARTMENTS OF VARIOUS SPACES/ZONES FOR ENABLING CONTROLLED COMFORT CONDITIONS AS PER THE REQUIREMENTS OF THE SPACES/ZONES TO OPTIMISE THE ENERGY CONSUMPTION.

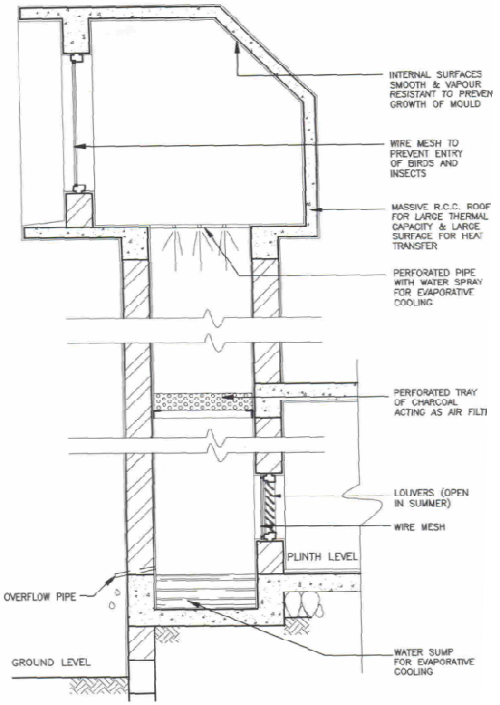
PASSIVE STRATEGIES IN THE BUILDING

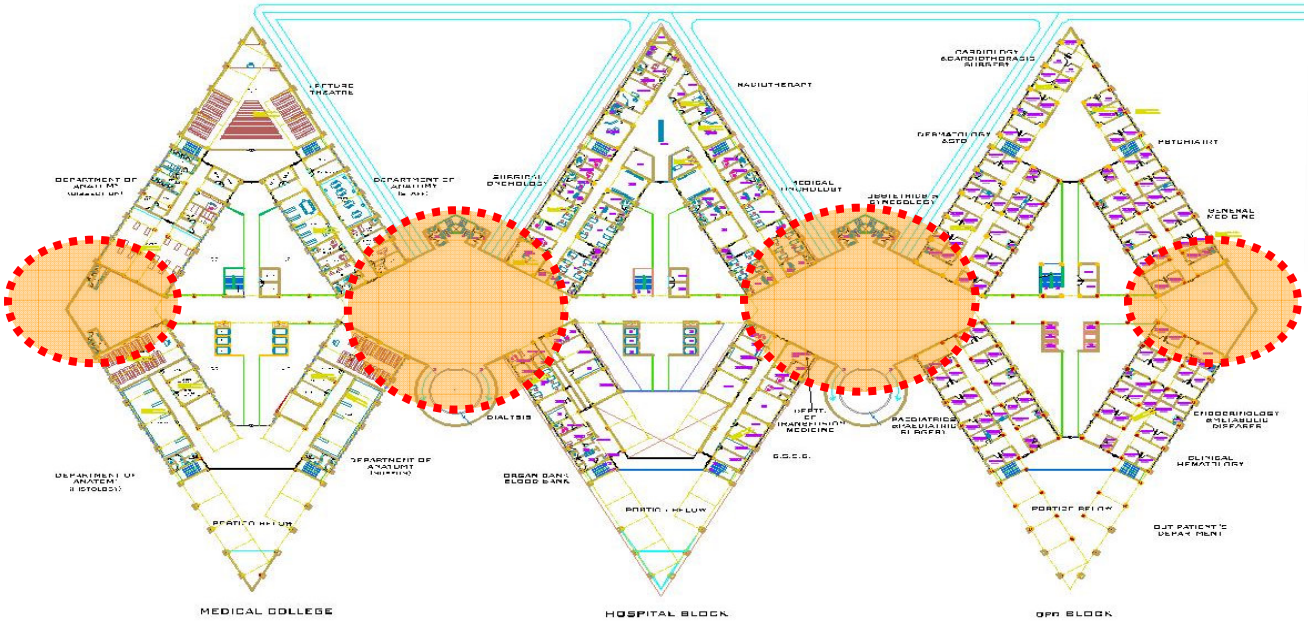
CLERESTORY

THIS STRATEGY IS ADOPTED TO ENHANCE LIGHTING INSIDE THE BUILDING. CLERESTORIES HAVE BEEN EFFECTIVELY USED IN THE ATRIA PLACED BETWEEN TWO BLOCKS.

TROMBE WALL

A TROMBE WALL IS A SUN-FACING WALL BUILT FROM MATERIAL THAT CAN ACT AS A THERMAL MASS COMBINED WITH AN AIR SPACE, INSULATED GLAZING AND VENTS TO FORM A LARGE SOLAR THERMAL COLLECTOR.





WIND TOWER

WIND TOWERS HAVE BEEN USED TO KEEP THE WAITING AREAS ADEQUATELY VENTILATED AND COMFORTABLE.

POSITION OF TROMBE WALL & CLERESTORY IN THE BUILDING

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SUN PATH & SOLAR CONTROL

FACADE EXPOSURE

THE BUILDING BLOCKS HAVE BEEN ORIENTED SUCH THAT THE MINIMUM FACADE IS EXPOSED TO THE HARSH WEST SUN.
THE WEST FACADE HAS BEEN WELL PROTECTED BY SELF SHADED COURTYARDS, A SKYWALK AND LOUVERS.

SUN-PATH

SHADING DEVICES

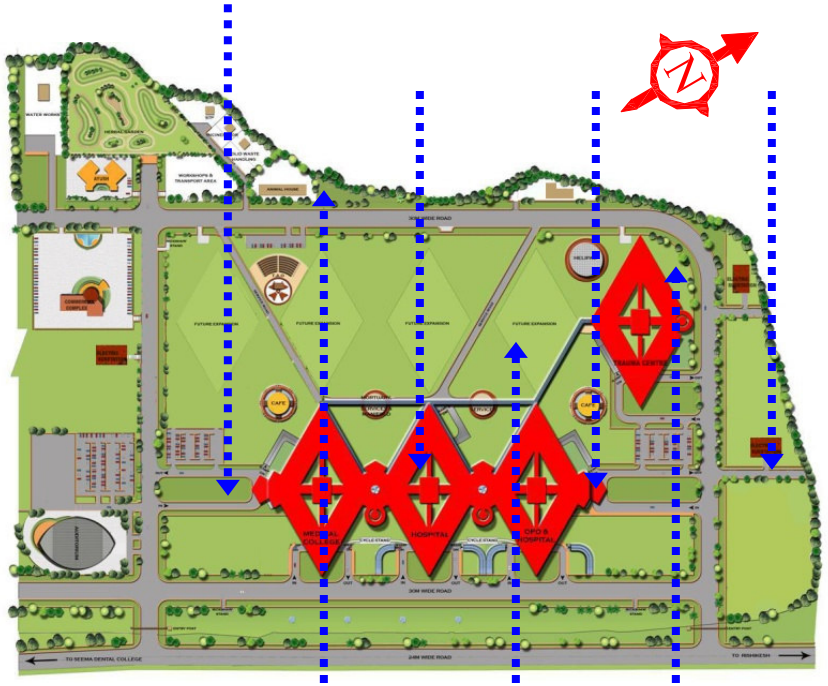
AMPLE SHADING DEVICES ARE BUILT INTO THE DESIGN:

- HORIZONTAL SUNSHADE FOR SOUTH FACING WINDOWS.
- APPROPRIATELY ANGLED LOUVERS FOR EAST, WEST FACING WINDOWS

ARE BUILT INTO THE DESIGN TO ENSURE OPTIMAL THERMAL COMFORT INSIDE THE BUILDING WITH LESS CONSUMPTION OF ENERGY.

WIND ORIENTATION

THE MEAN WIND MOVEMENT IS ON THE SOUTH EAST - NORTH WEST AXIS.

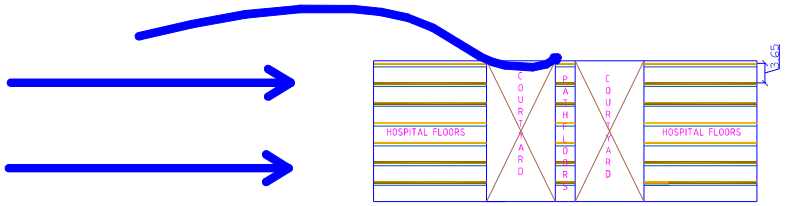


MEAN WIND MOVEMENTS

COURT YARD

THE GREAT EASTERN CONCEPT

(TROPICAL BIO-CLIMATIC)

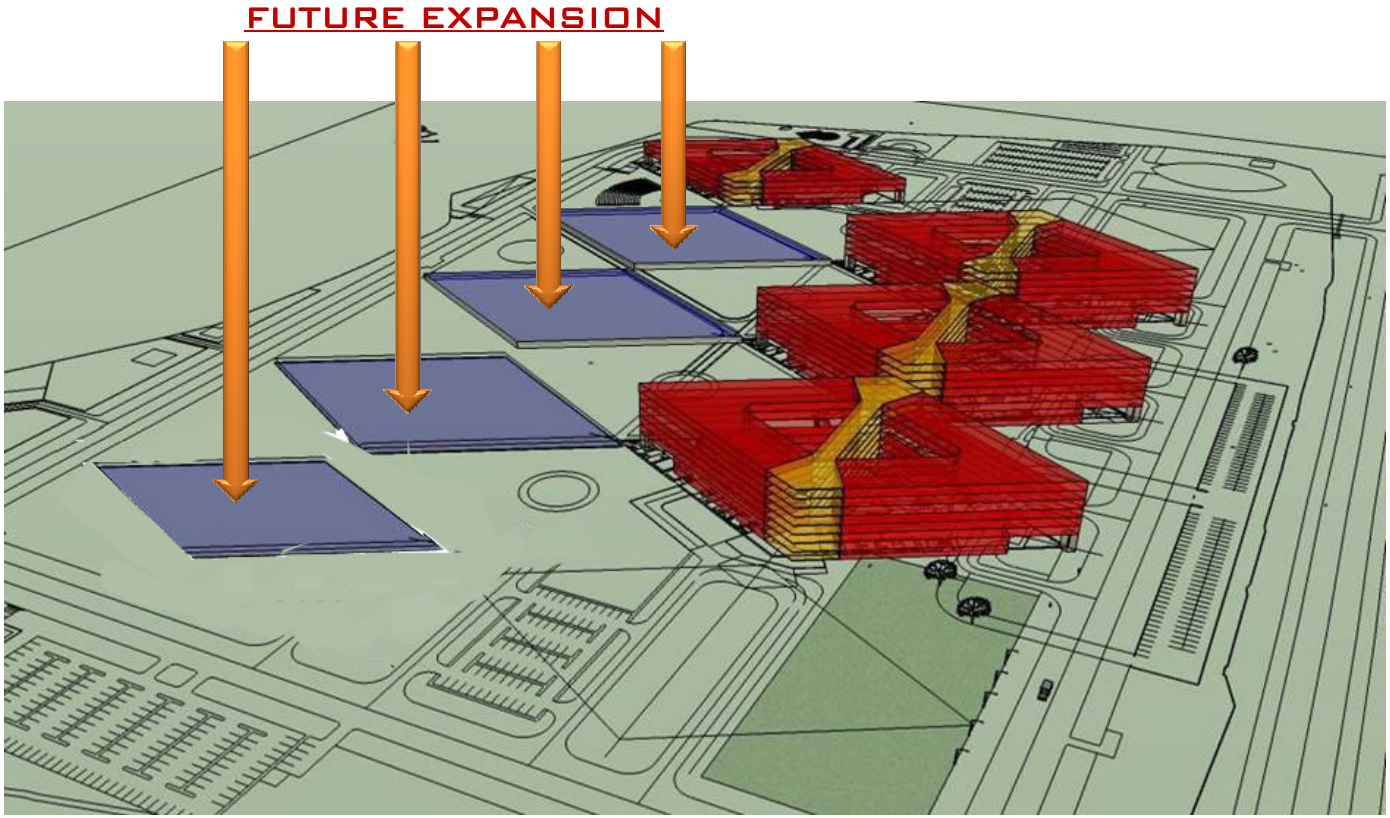


THE INTERNAL COURTYARDS HELP CUTDOWN THE WIND MOVEMENT DURING THE HARSH WINTERS TO HELP COMFORT CONDITIONS IN THE BUILDING WITH MINIMUM ENERGY. IN SUMMERS THE COURTYARD PROTECTS THE INTERNAL SPACES FROM HIGH OUTSIDE TEMPERATURES.

FUTURE EXPANSION

AS COMMUNITIES GROW THEIR BUILDINGS GROW

- CONTROLLED GEOMETRY ON MASTER PLAN, ENABLES FUTURE EXPANSION ON A TACIT SUBTLE GRID WITHOUT DISTURBING EXISTING ACTIVITY SPACES AND ALSO CREATING EXCELLENT MASS VOID RELATIONSHIP



Thank You

S U R I N D E R S A W H N E Y A S S O C I A T E S

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