SDI

TATTVA

PREDESIGN ANALYSIS AND CONCEPT REPORT

JANUARY 2026

EDUCATIONAL DIVISION

JAWAHARLAL NEHRU ARCHITECTURE AND FINE ARTS UNIVERSITY

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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TEAM SUMMARY

TEAM NAME : TATTVA

MEET THE TEAM TATTVA

TEAM LEAD

POOJA NANDIGAM
B.ARCH,4TH YEAR
(ARCHITECTURAL DESIGN)

NAVATEJA TELAGATHOTI
B.ARCH,4TH YEAR
(ENERGY PERFORMANCE)

LEHARIKA REDDY
B.ARCH,4TH YEAR
(COLLABORATIVE INNOVATION)

VITESH PHANEENDRA
B.ARCH,4TH YEAR
(HEALTH & WELL-BEING)

KRISHNA GOWTHAM
B.ARCH,4TH YEAR
(WATER PERFORMANCE)

HARSHIK ROHITH
B.ARCH,4TH YEAR
(VALUE PROPOSITION)

SREELEKHYA TEEPARTHY
B.ARCH,4TH YEAR
(AFFORDABILITY)

THRINISHA PANCHENENI
B.TECH DTDP, 4^{TH} YEAR
(EMBODIED CARBON)

HARSHA VARDHAN
B.TECH DTDP, 4^{TH} YEAR
(RESILIENCE)

SATWIK MALLADI
B.TECH MECHANICAL, 4^{TH}YEAR
(ENGINEERING & OPERATIONS)

fig 1.1. Team Members

TEAM APPROACH : Team Tattva consists of 10 fourth-year students from SPA- JNAFAU and JNTU Hyderabad, representing diverse disciplines including Architecture (B.Arch), Mechanical Engineering (B.Tech), and Digital Techniques in Design and Planning (DTDP).Our team works with a shared design vision and clear sustainability goals for the SDI competition. Responsibilities are divided into key focus areas based on individual strengths, with each area led by one member and supported by others to ensure collaboration and continuity. Regular team discussions and reviews help track progress, resolve issues, and maintain design clarity. This approach ensures active involvement of all members, smooth workflow, and a cohesive final proposal.

NAMES OF THE INSTITUTIONS

- Jawaharlal Nehru Architecture and Fine Arts University (JNAFAU).
- Jawaharlal Nehru Technological University, Hyderabad (JNTUH).

BACKGROUND OF THE LEAD INSTITUTION

With a heritage of more than 70 years, the Jawaharlal Nehru Architecture and Fine Arts University (JNAFAU) was established by Act of Andhra Pradesh State Legislature No. 31 of 2008. The university offers undergraduate (Architecture, Planning, Interior Design), post-graduate and PhD research programs. It consists of the School Of Planning & Architecture (SPA) and the College of Fine Arts (CFA) fostering interdisciplinary education.

fig 1.2.1. Lead Institution Logo

fig 1.2.2. Lead Institution

FACULTY LEAD

Dr. Aditya Singaraju is a Professor in Architecture at SPA, JNAFAU, Hyderabad, with over 25 years of teaching experience. An alumnus of SPA–JNTU (1997), he holds an M.Des from IISc Bangalore (2000) and a PhD in Architecture (2025). He has mentored architecture and design students for 16 years and is the Principal Architect at IDENTIFIVE Designs, with professional affiliations to IIA, IIID, HMA, and ICAS.

AR. SINGARAJU ADITYA MALLIKARJUNA

Assistant Professor in Architecture
(Adhoc, JNAFAU)
B.Arch, M.Des,PhD

FACULTY ADVISOR

Ar. Kalyani Peddada is an Assistant Professor at the School of Planning and Architecture, JNAFAU, with over 6 years of teaching experience. She is also a practising architect, actively involved in professional practice, bringing a strong balance of academic insight and practical exposure to architectural education.

AR. KALYANI PEDDADA

B.Arch, M.Tech(Planning),
M.B.A(Project Management)

fig 1.3. Faculty Details

SOFTWARES USED

fig 1.4. Softwares Used

TATTVA

PROJECT SUMMARY

PROJECT NAME: GOOD SHEPHERD SCHOOL

PROJECT PARTNER: STHAPATI ARCHITECTS

Architectural and interior design firm based in Raidurgam,Hyderabad,Telangana. The firm has been active since the mid-2000s and works closely with clients to deliver customized architectural solutions on Residential & Commercial Projects.

fig 2.1. Project Partner Logo

ABOUT THE CLIENT

G.Inna Reddy (Director of the School).

CLIENT BACKGROUND :

Good Shepherd School is a reputed educational institution established in 2007 with the objective of delivering quality and value-based education to students in and around Vinukonda.
The institution was founded to address the lack of well-equipped schools in smaller towns and rural areas. Under the leadership of Dr. G. Inna Reddy, the school has steadily evolved by adopting modern teaching practices, digital learning tools, and a student-centric academic approach while maintaining affordability and accessibility.

KEY INDIVIDUAL

AR.NILESHA
SENIOR ARCHITECT
AT STHAPATI

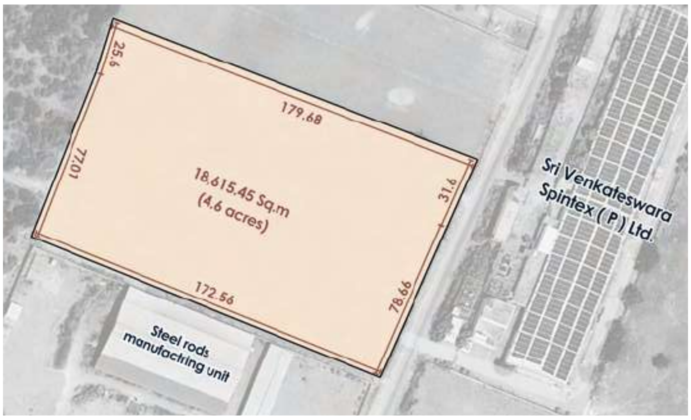


fig 2.2. Site Plan

LONGITUDE : 80°08'18.6"E
LATITUDE: 16°07'58.1"N

N

AREA STATEMENT

Total site area	**18,615.45 m²**
FAR/FSI	0.6-0.9 depending on surrounding density
Permissible built-up area (m²)	11,160 m² to 16,740 m²
Proposed (estimated) areas (m²)	Admin- 1281.15 m²+ Academic -5,906.25 m²+ Parking- 2,300m²+ Ground- 3,800 m²= 13,287.4 m² (total area incl. 35% circulation)

table 1.0. Area Statement

PROJECT DESCRIPTION

LOCATION: The Project is situated in KAVURU, Chilakaluripeta, Andhra Pradesh, India.

ECBC CLIMATE ZONE : WARM AND HUMID

STATUS OF THE PROJECT

The project called for a school to students starting from 1st grade to 10th pertaining to CBSE by-laws. One administration block & Two academic blocks are to be built in the given site. The site is well-connected by road networks and lies within semi-urban context, surrounded by residential - commercial developments.
The project seeks to blend vernacular techniques and cultural sensibilities with contemporary design solutions to create a sustainable, user-friendly institutional environment.

PROFILE OF OCCUPANTS:

The user groups include students, teaching and non-teaching personnel, security staff, maintenance and janitorial teams, along with visitors and parents.

HOURS OF OPERATION

Day-scholars - 7hours 30 minutes per day.

CLIENT SPECIAL REQUIREMENTS

The campus shall adopt a simple, pleasant, and context-responsive architectural language that is cost-effective, easy to maintain, and visually distinctive without unnecessary complexity. The master plan shall be developed in three independent phases, each functioning as a complete and coherent unit. The campus shall comprise three integrated blocks Junior, Administration, and Main Academic ensuring strong physical and visual connectivity. The Administration Block shall include 140 sqm of office space at ground level and a 140 sqm multipurpose hall with large clear spans for flexibility. The Main Academic Block shall house 40 uniformly sized classrooms with wide staircases, generous corridors, and modular planning to allow future conversion into larger spaces. With dual road access from the north and south, building massing shall address both frontages, with the primary entry from the south. Building height shall be limited to G+2 floors. The campus shall be future-ready for horizontal and vertical expansion and comply with all applicable government safety, accessibility, and child-friendly norms.

ENERGY PERFORMANCE INDEX (EPI) GOAL - ≤40 KWH/M²/YEAR

PRELIMINARY ESTIMATE OF ON-SITE RENEWABLE ENERGY

Assuming that we use more than 60% of the rooftop area for solar panels to generate solar energy,
the area of the roof would be 7,167.15 m² × 0.6 = 4,300.29 m².
Considering solar panels of 450 W, Annual energy generated by each panel =(0.45 kWp×1,500)= 675 kWh/year
Each solar panel occupies 2.1 m² of area, number of solar panels =(4,300.29 m² / 2.1 m²)= 2048 panels
Therefore, the annual on-site renewable energy potential using solar panels would be approximately
~2048 (Solar panels) x 675(kWh/year per panel) = 13,82,400 kWh/year.

For a built-up area of 7,167.15 m² with an estimated energy consumption of 150 kWh/m² per year benchmark based on building type and conditions, the total energy demand is calculated to be 10,75,072.5 kWh annually. To meet this energy requirement using a biomass system operating at 30% efficiency, the system would need to supply approximately 35,83,575 kWh/year. If Rice husk are chosen as the biomass fuel source, with an energy content of 3000 kWh per tonne (standard conservative assumption) , the annual biomass requirement would be around 1,194.52 tonnes/year. This estimation accounts for the system's efficiency and the energy content of the selected biomass.

PRELIMINARY CONSTRUCTION BUDGET

Project Summary								
Projec	Project Information							
	Team:	TEAM TATTVA						
	Division:	EDUCATIONAL BUILDING		Land Cost:	108.4	Million INR		
		Site Area (sqm)	18,616	City:	Chilakaluripet			
		Built-up Area (BUA) (sqm)	13,000	State:	Andhra Pradesh			
		Ground Coverage (Plinth Area) (sqm)	7,446					

Project Summary								
S.No.	Particulars	Definition	Baseline Estimate (Project Partner / SOR basis)			Proposed Design Estimate		
			Amount in Million INR	%	Amount (INR per sqm)	Amount in Million INR	%	Amount (INR per sqm)
1	Land	Cost of land purchased or leased by the Project Partner	108.40	31.1%	8,338	0.00	0.0%	-
2	Civil Works	Refer Item A, Civil works in Cost of construction worksheet	108.00	31.0%	8,308	400.00	114.8%	30,769
3	Internal Works	Refer Item B, Civil works in Cost of construction worksheet	21.60	6.2%	1,662	80.00	23.0%	6,154
4	MEP Services	Refer Item C, Civil works in Cost of construction worksheet	38.40	11.0%	2,954	120.00	34.4%	9,231
5	Equipment & Furnishing	Refer Item D, Civil works in Cost of construction worksheet	19.20	5.5%	1,477	80.00	23.0%	6,154
6	Landscape & Site Development	Refer Item E, Civil works in Cost of construction worksheet	9.60	2.8%	738	40.00	11.5%	3,077
7	Contingency	Amount added to the total estimate for incidental and miscellaneous expenses.	14.40	4.1%	1,108	24.00	6.9%	1,846
	TOTAL HARD COST		319.60	91.7%	24,585	744.00	213.5%	57,231
8	Pre Operative Expenses	Cost of Permits, Licenses, Market research, Advertising etc	4.80	1.4%	369	8.00	2.3%	615
9	Consultants	Consultant fees on a typical Project	16.80	4.8%	1,292	40.00	11.5%	3,077
10	Interest During Construction	Interest paid on loans related to the project during construction	7.20	2.1%	554	8.00	2.3%	615
	TOTAL SOFT COST		28.80	8.3%	2,215	56.00	16.1%	4,308
	TOTAL PROJECT COST		348.40	100.0%	26,800	800.00	229.6%	61,538

table 2.0 Preliminary Construction Budget

CASE STUDY SUMMARY

1.PERI-URBAN CONTEXT- THE SCHOOL OF RAYA

- Location: Hennur–Bagalur Road, Dasanayakanahalli, Bengaluru.
- Site Area: 9 Acres
- Climate: Warm-Moderate

fig 3.1.1 Case Study -1 Campus Views

SITE ECOLOGY

A key sustainability strategy at Raya is landscape-led microclimate design. About 93,000 sq ft of green cover, with 30+ tree species and 45 shrub species, creates shaded microhabitats that support local biodiversity. This dense, layered landscape helps keep campus temperatures 2–3°C lower than Bengaluru's average, reducing cooling loads and improving comfort in outdoor learning and circulation spaces.

LOW-IMPACT MATERIALS

Raya uses eco-friendly, durable materials like bamboo and recycled wood, supported by a plastic-free approach. Modular and prefabricated construction reduces waste and material use.
These strategies lower embodied carbon and lifecycle impacts, supporting a true net-zero vision.

ENERGY CONSERVATION

Raya reduces energy demand through daylighting, natural ventilation, and efficient systems. Roofs are designed to be solar-ready. This supports a net-zero-ready strategy of reducing loads first, then offsetting them with renewables.

WATER CONSERVATION

Water management follows a closed-loop system using rainwater recharge, STP-treated wastewater reuse, and drip irrigation.
This reduces freshwater demand while sustaining landscape-based cooling.

PASSIVE DESIGN STRATEGIES

The campus strongly relies on passive design before active systems, which is critical for net-zero performance:

- Orientation & massing allow controlled daylight and reduced heat gain
- Large openings, courtyards, and skylights enhance daylighting, minimizing artificial lighting demand
- Natural cross-ventilation through porous planning reduces dependency on mechanical cooling
- Shaded walkways, recessed openings, and vegetation act as thermal buffers

2.RURAL CONTEXT- NISHA'S PLAY SCHOOL, GOA

- Location: Assagao, North Goa.
- Site Area: 2 Acres
- Climate: Warm–humid

LANDSCAPE & MICROCLIMATE

Dense tropical planting and shaded outdoor areas moderate heat and glare, creating comfortable play spaces suited to Goa's warm–humid climate while supporting local biodiversity.

LOW-IMPACT MATERIALS

Locally sourced, low-energy materials such as brick, laterite, wood, and lime-based finishes are used to reduce embodied energy and blend with the regional context.

WATER CONSERVATION

Rainwater harvesting and on-site wastewater reuse support landscaping needs, reducing dependence on municipal water and maintaining green cover year-round.

SPACE PLANNING

The school uses low-rise, open-ended planning with spill-out classrooms, verandahs, and courtyards that encourage indoor–outdoor learning and constant visual connection to nature.

ENERGY CONSERVATION

Daylighting and natural ventilation reduce energy demand, supported by energy-efficient lighting and appliances—placing the campus in a low-energy, net-zero-ready category.

PASSIVE DESIGN STRATEGIES

Deep overhangs, sloped roofs, shaded corridors, and cross-ventilation minimize heat gain and reliance on mechanical cooling, ensuring thermal comfort for children.

fig 3.1.2. Case Study-2 Campus Views

3.URBAN CONTEXT- RAMAGYA SCHOOL, NOIDA

- Location: Delhi-NCR
- Site Area: 5 Acres
- Climate: Composite

LANDSCAPE & MICROCLIMATE

Landscaped courts, tree-lined edges, and shaded play areas help mitigate heat, dust, and noise from surrounding roads, improving outdoor comfort in a hot composite climate.

PASSIVE DESIGN STRATEGIES

Courtyards, shaded corridors, controlled window openings, and orientation reduce heat gain while allowing daylight and ventilation where feasible.

SPACE PLANNING

Planning follows a compact, zoned layout with academic blocks organized around courtyards and play areas, ensuring clear circulation, safety, and age-wise segregation.

MATERIALS

Use of durable, low-maintenance materials such as concrete, brick, and stone suited for high-traffic school environments, prioritizing longevity and reduced lifecycle costs.

fig 3.1.3.Case Study-3 Campus Views

CONTEXT ANALYSIS

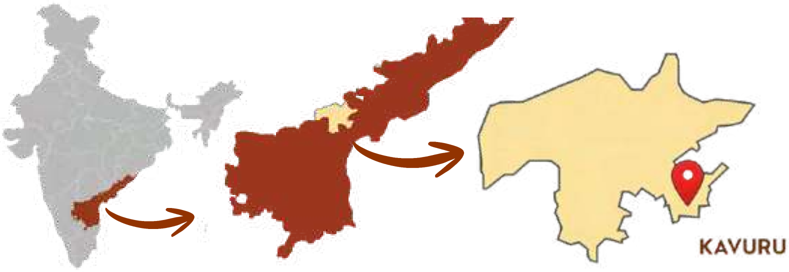


fig 4.1. Context Map

Kavuru is a rural village in Palnadu District, Andhra Pradesh, located near Chilakaluripet and connected by local village roads, functioning as a residential and agrarian settlement that depends on Chilakaluripet for education, healthcare, markets, and higher-order services.

SOCIAL, ECONOMIC & CULTURAL CONTEXT

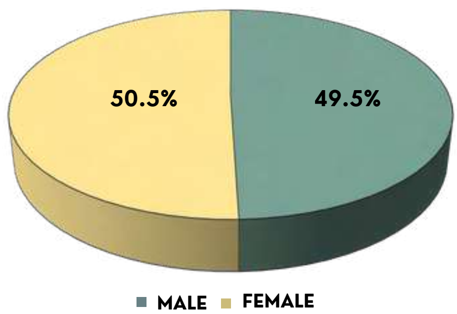
Kavuru village has a population largely comprising lower-middle income households primarily dependent on agriculture and allied activities for their livelihood. Social life in village is community oriented, with daily activities centered around local schools, places of worship, shared open spaces, and agricultural routines. Culturally, Kavuru retains strong agrarian traditions, local festivals, and vernacular building practices, reflecting a close relationship with the land and influencing the need for simple, affordable, and climate-responsive development.

Lower - middle to middle income families | **Agriculture (cotton, chilli, paddy)** | **Small trade & transport**

₹1.5-5 lakh/year | ₹3.5 lakh/year | Government & private service sector

fig 4.2. Socio Economic Background

MALE & FEMALE POPULATION



LITERACY DISTRIBUTION

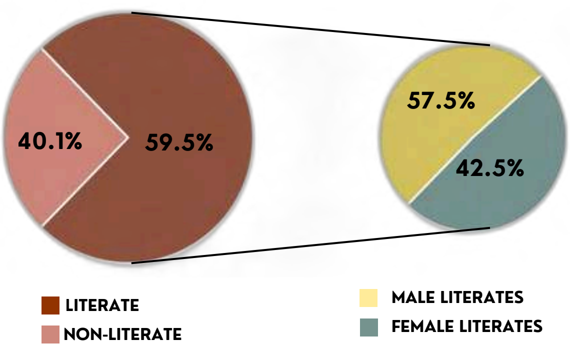


fig 4.3. Population & Literacy Distribution

LOCALLY AVAILABLE MATERIALS

BURNT CLAY BRICKS

Manufactured in traditional brick kilns using Krishna river belt clay near Guntur and transported to Kavuru over a distance of 40–60 km.

KADAPA STONE

Quarried in Kadapa district of Andhra Pradesh and transported to Kavuru over a distance of about 300–350 km.

FLY ASH

Manufactured in fly-ash brick units around Guntur–Mangalagiri using thermal power plant by-products and transported within a distance of 50–60 km.

BLACK GRANITE

Quarried from granite belts around Phirangipuram and Repudi in Guntur district and transported over 40–60 km.

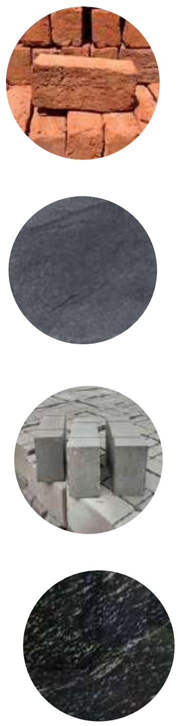


fig 4.4. Locally Available Materials

GOALS AND STRATEGIES

ARCHITECTURAL DESIGN

01

GOAL: To promote a climate-responsive academic environment by achieving daylight access in about 70% of occupied spaces and natural ventilation in nearly 60% of learning areas, maintaining 300–500 lux daylight levels and comfortable indoor temperatures, thereby reducing dependence on artificial lighting and cooling systems.

STRATEGY: A north–south orientation, narrow floor plates (≤7.5 m), and climate-responsive façades with shading, jaalis, and courtyards enhance daylight, ventilation, and heat control.A minimum floor-to-floor height of 3.6 m supports efficient air movement, occupant well-being, and learning performance.

ENGINEERING AND OPERATIONS

02

GOAL: The goal is to design a durable, climate-resilient structural system with a minimum 50-year service life, suited to warm-humid and monsoon conditions while reducing maintenance by ≥25%.

STRATEGY: A regular RCC structural grid ensures efficient construction,durability, and ease of maintenance using climate-appropriate materials and detailing. Sloped roofs, effective drainage, adequate plinth levels, and accessible services enhance long-term performance and monsoon resilience.

COLLABORATIVE INNOVATION

03

GOAL: The goal is to design an energy-efficient building that reduces heat gain by ≥30%, generates 15–20% of annual energy from renewable sources, and lowers carbon emissions using low-impact local materials.

STRATEGY: This is achieved through integrated renewable systems, shaded circulation, high-reflectance roofs, deep overhangs,
and self-shading courtyards formed by coordinated building and landscape design.

HEALTH & WELL-BEING

04

The design ensures occupant well-being by maintaining thermal comfort (24–30°C, 30–60% RH) with cross-ventilated classrooms and strong indoor–outdoor connectivity.

Orientation to prevailing winds, operable high-level windows, light-colored surfaces, green roofs, and courtyards reduce heat gain while supporting airflow and daylight.

ENERGY PERFORMANCE

05

GOAL: The design reduces energy demand by ≥40%, targets an EPI of ≤40 kWh/m²/year, and meets at least 20% of annual energy needs through onsite renewables.

STRATEGY: This is achieved through maximum daylight use, LED lighting, efficient fans, natural ventilation, rooftop solar PV, and minimal reliance on HVAC systems.

WATER PERFORMANCE

06

GOAL: The design enhances water efficiency by reducing potable water use, promoting greywater treatment and reuse for flushing and landscaping, and harvesting rainwater to manage annual runoff sustainably.

STRATEGY: This is achieved through low-flow fixtures, dual plumbing for treated water reuse, rainwater harvesting and recharge trenches, and native, drought-tolerant landscaping to minimize irrigation demand.

EMBODIED CARBON

07

GOAL: The design aims to reduce embodied carbon compared to conventional RCC schools while sourcing at least 50% of materials locally through material-efficient strategies.

STRATEGY: This is achieved by optimized structural design, minimizing high-carbon finishes, encouraging exposed surfaces, and efficient planning to lower overall environmental impact.

RESILIENCE

08

GOAL: The design ensures uninterrupted school operation during extreme weather by preventing flooding and maintaining thermal comfort during power outages.

STRATEGY: This is achieved through raised plinths, effective stormwater management, shaded areas, and passive cooling strategies that reduce reliance on mechanical systems.

AFFORDABILITY

09

GOAL: The design maintains construction costs within ₹1,800–₹2,200/sq.ft. while reducing long-term energy and water costs by over 40% for a cost-effective learning environment.

STRATEGY: This is achieved through simple massing and structural grids, passive design strategies, durable local materials, and flexible layouts that allow future expansion without major demolition.

VALUE PROPOSITION

10

GOAL: The design envisions a climate-responsive, net-zero-ready school model that is replicable in Tier-2 and Tier-3 towns and functions as a living learning environment.

STRATEGY: This is achieved by making sustainable systems visible, integrating them into daily student experience, and designing outdoor spaces as social, academic, and climatic buffers rooted in local climate, culture, and economy.

TATTVA

BUILDING AREA PROGRAMME

SPACES	AREAS	NO.	AREA(sq.m.	TOTAL AREA(sq.m.)	MODE
ADMIN SPACES AND STAFF AREAS	PRINCIPAL ROOM	1	50	50	MIXED MODE
	VICE-PRINCIPAL ROOM	1	40	40	MIXED MODE
	ADMIN OFFICE ROOM	1	60	60	MIXED MODE
	COUNSELLOR ROOM	1	24	24	CONDITIONED
	ACCOUNTS OFFICE	1	25	25	MIXED MODE
	RECORD/FILE ROOM	1	15	15	UNCONDITIONED
	NON - TEACHING STAFF(40 MEMBERS	2	40	80	MIXED MODE
	TEACHING STAFF AREA(50 TEACHERS)	2	80	160	MIXED MODE
	CONFERENCE ROOM	1	60	60	CONDITIONED
	MULTI PURPOSE ROOM	1	150	150	MIXED MODE
	FOYER AND RECEPTION	1	95	95	UNCONDITIONED
	TOILETS	2	20	40	UNCONDITIONED
	STORE ROOM	1	25	25	UNCONDITIONED
				824	
ACADEMIC SPACES	CLASSROOMS (1 TO 10)	30	60	1800	MIXED MODE
	MATHS LAB	1	80	80	UNCONDITIONED
	SCIENCE LAB	1	95	95	MIXED MODE
	PHYSICS LAB	1	95	95	MIXED MODE
	CHEMISTRY LAB	1	95	95	CONDITIONED
	BIOLOGY LAB	1	95	95	CONDITIONED
	SOCIAL SCIENCE LAB	1	90	90	MIXED MODE
	ART & CRAFT ROOM	1	75	75	MIXED MODE
	ACTIVITY ROOM	2	90	180	MIXED MODE
	COMPUTER LAB	2	140	280	CONDITIONED
	LIBRARY	1	180	180	MIXED MODE
	AUDIO VISUAL ROOM	1	80	80	CONDITIONED
	TOILETS (GIRLS)	2	40	80	UNCONDITIONED
	TOILETS (BOYS)	2	40	80	UNCONDITIONED
	STORE ROOM	1	25	25	UNCONDITIONED
				3330	
EXTRA CURRICULAR ACTIVITIES	DANCE ROOM	1	100	100	MIXED MODE
	MUSIC ROOM	1	80	80	MIXED MODE
	AUDITORIUM	1	500	500	MIXED MODE
	YOGA ROOM	1	120	120	UNCONDITIONED
				800	
COMMON SPACES	INFIRMARY	2	15	30	MIXED MODE
	N. C. C.	1	30	30	MIXED MODE
	P. E. T. ROOM	1	65	65	MIXED MODE
	CANTEEN & KITCHEN	1	120	120	UNCONDITIONED
				245	
SERVICE SPACES	SERVICE STAFF ROOM	2	15	30	UNCONDITIONED
	SECURITY ROOM	1	15	15	UNCONDITIONED
	ELECTRICAL ROOM	1	25	25	UNCONDITIONED
	STP ROOM	1	30	30	UNCONDITIONED
	PLUMBING ROOM	1	25	25	UNCONDITIONED
				125	
TOTAL		76		5324	7167.15 (with 35% circulation)
TOTAL CONDITIONED AREA					634
TOTAL UNCONDITIONED AREA					805
TOTAL MIXED MODE AREA					3790

table 3.0 Building Area Programme

NOTE:
- UNCONDITIONED: Includes Natural Ventilation(Without HVAC)
- MIXED MODE: Includes Natural Ventilation(Use of Fans with respect to comfort)
- CONDITIONED: Includes HVAC

BUILDING AREA PROGRAMME

NOTE: THE CLIENT'S REQUIREMENT CALLS FOR THREE INTEGRATED BLOCKS:
PRIMARY BLOCK, ADMINISTRATION BLOCK, AND MAIN SECONDARY ACADEMIC BLOCK

NO. OF FLOORS:
GROUND FLOOR (For Administration Block)
G+1 (For Primary Block)
G+2 (For Secondary Block)

SCHOOL CAPACITY:
1200 Students, 90 staff
(Teaching staff -40, Non-teaching - 16, Admin & management - 10, Maintenance & housekeeping - 12, Security - 6)

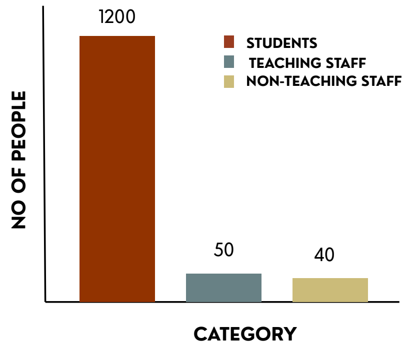


fig 5.1. Student-Teacher Ratio

AREA SUMMARY:

Total site area	**18,615.45 m²**
Total estimated Built-up Area	7,167.15 m²
Landscape Area	5,000 m²

table 4.1. Area Summary

DESIGN PROGRAMME:

Maximum Ground Coverage	**3,465 m²**	18.61 % of plot area
Parking Area	2,300 m²	12.35 % of plot area
Landscape Area	5,000 m²	26.85 % of plot area

table 4.2. Design Programme

CLIMATE DATA

Climatic analysis for the Kavuru site is based on Bapatla climate data, the nearest IMD station located about 50 km away.
This was the nearest location with officially available data from the Meterological department for the region.

- LOCATION: Bapatla, Andhra Pradesh
- LATTITUDE&LONGITUDE: 15.9 North,80.467 East

Administration Spaces- 1281.15 m²
Academic Spaces -5,886 m²
(incl. 35% circulation)
Parking- 2,300m²
Ground- 3,800 m²

TEMPERATURE
Average Yearly Temperature: ≈ 28.0 °C
Hottest Yearly Temperature (99%): ≈ 39–40 °C
Coldest Yearly Temperature (1%): ≈ 18–19 °C

RAINFALL
Average Annual Rainfall: ≈ 860–880 mm / year
Monsoon Period: June – September
Rainfall Character: Moderate to high seasonal rainfall, suitable for rainwater harvesting

HUMIDITY
Average Relative Humidity: 65% – 80%
Peak Humidity: Monsoon months (July–September)
Climate Character: High humidity with limited diurnal variation, typical of warm–humid regions

WIND
Prevailing Wind Direction: West–Southwest (W–SW)
Secondary Wind Direction: North-East / East (winter months)
Average Wind Speed: 2 – 7 m/s
Peak Wind Months: May – September

FINDINGS FROM PRE-DESIGN ANALYSIS

CLIMATE ANALYSIS

- Natural and fan-assisted ventilation maintain comfort for most of the year, as most hours fall within or near the adaptive comfort zone, making mixed-mode operation effective. Mechanical cooling with dehumidification is required only during short peak hot-humid periods, supporting a net-zero design approach.

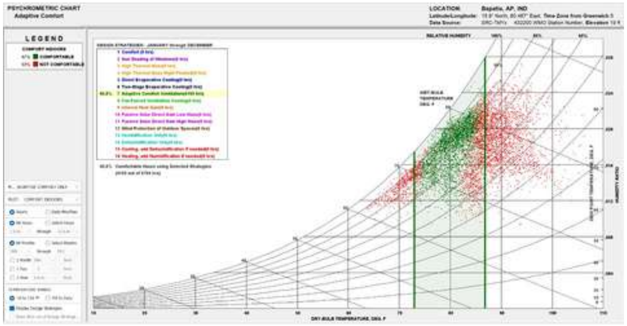


fig 6.1.1. Psychometric Chart

- Prevailing winds are from the West–Southwest, especially during summer and monsoon, supporting building orientation and openings for effective cross-ventilation. Moderate wind speeds (≈2–7 m/s) are ideal for natural and fan-assisted ventilation, enabling a low-energy mixed-mode cooling strategy.

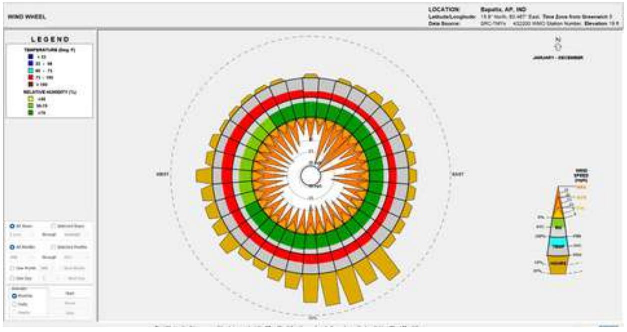


fig 6.1.2. Wind Wheel

- Hot conditions prevail from March to September, with peak heat stress during April–June, requiring strong passive heat-control measures. From November to February, conditions are more comfortable, allowing natural ventilation and a mixed-mode strategy with minimal mechanical cooling.

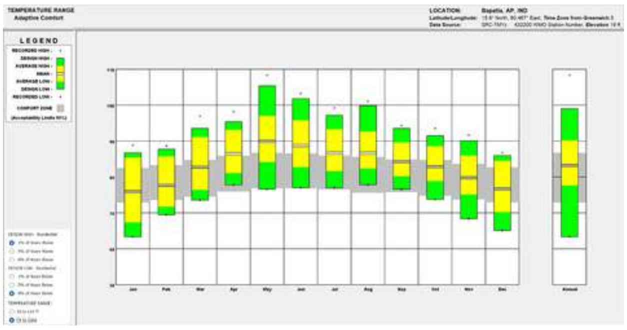


fig 6.1.3. Temperature Range Graph

- High temperatures and solar radiation from March to September make solar heat gain the main source of discomfort, requiring effective shading and envelope control. Cooler nights support night ventilation and thermal flushing as passive cooling strategies.

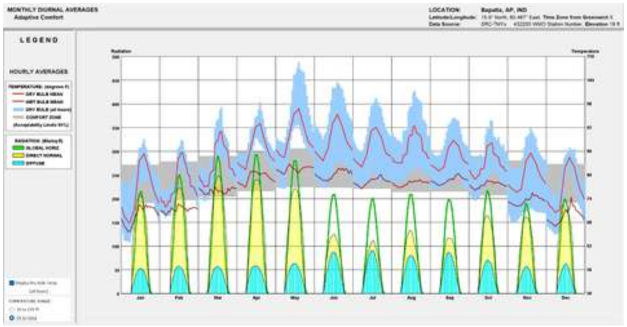


fig 6.1.4. Monthly Diurnal Averages Graph

- Strong sun exposure from March to October results in long hours of solar gain, requiring effective shading, especially on east and west façades. Seasonal sun-angle variation allows summer shading while permitting controlled winter solar entry for daylighting and passive warmth.

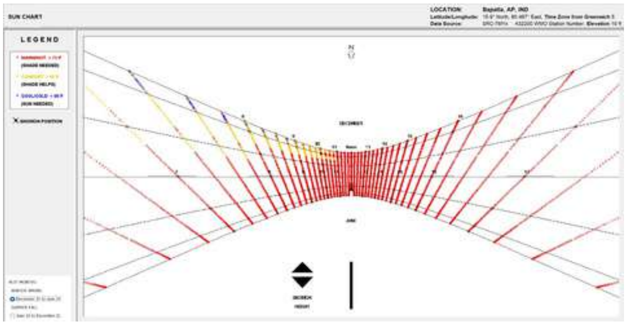


fig 6.1.5. Sun chart

SITE ANALYSIS

Location: Kavuru, Chilakaluripeta, Andhra Pradesh, India
Longitude : 80°08'18.6"E & **Latitude:** 16°07'58.1"N
Plot area (m²) : 18,615.45 m²
Plot shape : Rectangular
Orientation : (long axis N–W / E–S)
Current land use : Vacant plot surrounded by agricultural land, small industries, and low-density development

Site boundaries & access roads :

- Front edge connected to the primary access road
- Rear edge abutting low-lying areas near village
- Front access: Primary and most frequently used
- Rear access: Secondary, based on client requirement

Surrounding Building Heights:

- SE: Steel industry – 8–10 m
- NE: Thread mill – ~12 m
- S: Residential buildings – ~12 m
- NW: Factory – ~9 m

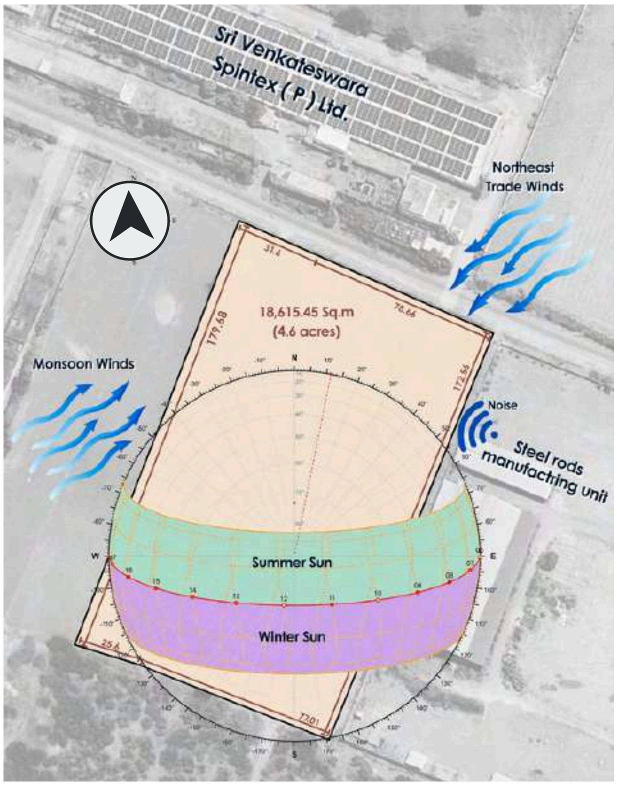


fig 7.0. Site Analysis

S

- Rectangular plot enables efficient planning and clear zoning.
- Low traffic noise ensures a calm learning environment.
- Multiple access points allow segregation of public, service, and emergency movement.
- Prevailing winds support natural ventilation.
- Low surrounding building heights ensure good daylight access.

W

- Flood-prone area at the rear of the site due to natural contours.
- No existing vegetation on-site, leading to high heat exposure.
- Dusty access roads affect outdoor comfort and air quality.
- Heat gain from nearby industrial structures.

O

- Landscape buffers and water-sensitive design can improve microclimate.
- Scope for outdoor learning spaces due to low noise levels.
- Orientation-based massing can reduce solar heat gain.
- High solar exposure supports on-site renewable energy generation.

C

- Managing flood risk through plinth design and site grading.
- Mitigating dust, heat, and reflected radiation from surroundings.
- Ensuring thermal comfort in outdoor and semi-open spaces.

Topography & Soil Conditions

- Slope: Gentle slope with approximately 3 m level difference
- Contour Direction: NE to SW
- Natural Drainage: Flows towards the rear edge of the site
- Flood-Prone Zone: Identified towards the back of the site due to contour conditions
- Soil Type:
  - Red soil
  - Black soil
  - Pockets of alluvial soil

Utilities & Infrastructure

- Electricity: Grid-connected supply available
- Water Source: dependent on borewell
- Stormwater: Natural drainage slope available, requires channeling
- Sewage: Potential for on-site septic tank / STP

PRELIMINARY THERMAL COMFORT ANALYSIS FOR SIMPLE BOX MODELS

RADIATION ANALYSIS

Radiation analysis evaluates the annual solar energy (kWh/m²) received by building roofs and façades. The colour gradients show varying heat gain, helping identify high-exposure zones, self-shaded areas, and the thermal impact of orientation and massing on overall design performance.

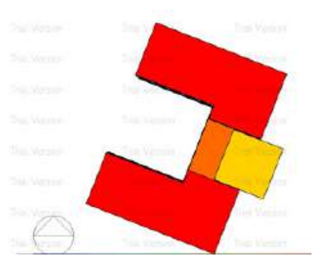
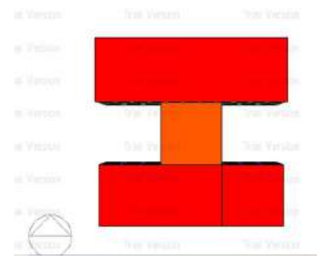
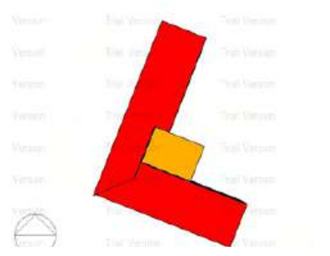
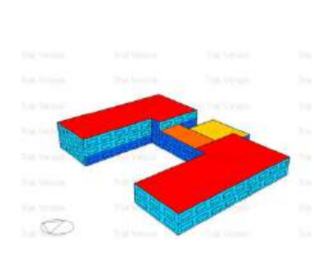
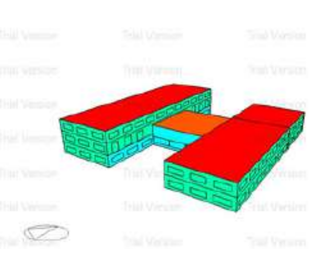
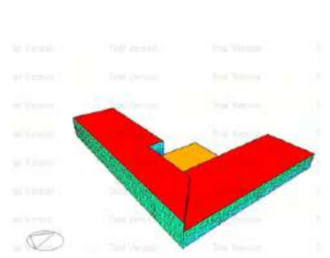
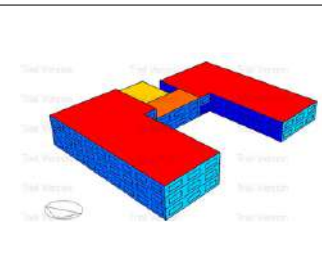
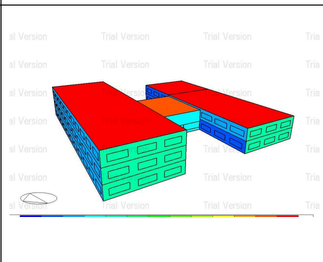
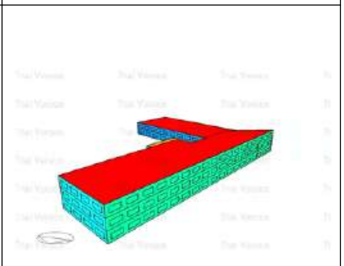
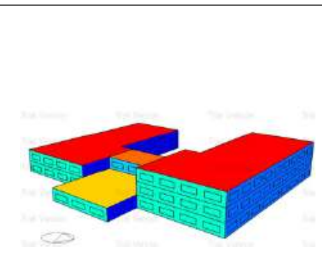
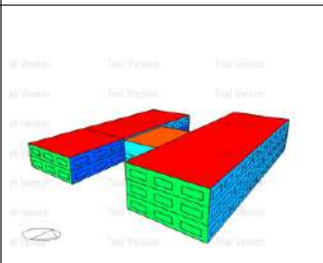
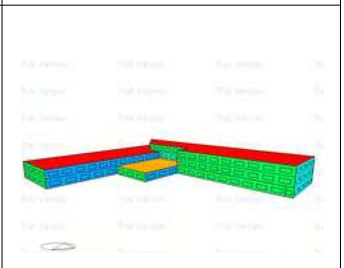
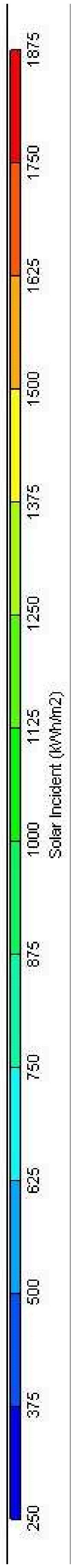
LAYOUT	OPTION 1	OPTION 2	OPTION 3
TOP VIEW			
SOUTH EAST			
NORTH WEST			
NORTH EAST			
ENERGY PERFORMANCE INDEX (EPI)	41.58 kWh/m²	55.44 kWh/m²	39.66 kWh/m²

table 5.1. Thermal Comfort Analysis for Simple Box Models



Hence, Option 3 performs best with the lowest EPI due to better self-shading, Option 2 has higher solar exposure, and Option 1 shows moderate performance.

PRELIMINARY ANALYSIS IDENTIFYING STRATEGIES AND APPROACHES FOR ENERGY DEMAND REDUCTION

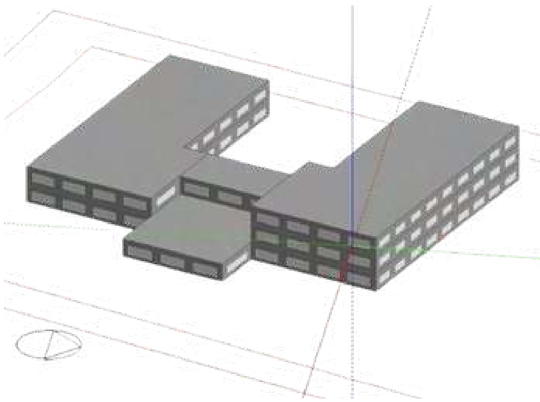
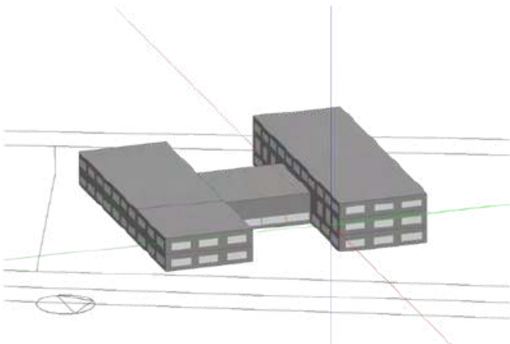
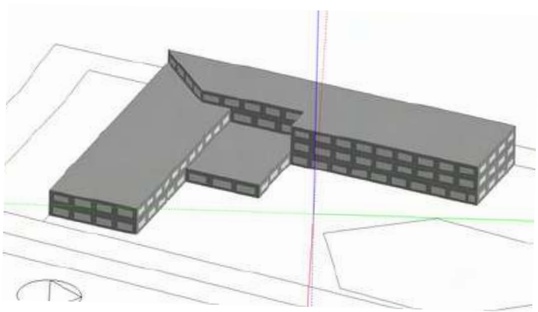
BOX MODEL	EPI VALUE ACHIEVED	ENERGY REDUCTION STRATEGIES USED
	41.58 kWh/m²	• Building blocks are oriented to allow basic east–west alignment, reducing excessive low-angle solar gain on longer façades. • Linear massing enables cross-ventilation across classrooms, supported by openings on opposite facades. • Natural ventilation is used as the primary cooling strategy, with mechanical cooling restricted only to laboratories. • Use of energy-efficient LED lighting and low-power electrical appliances reduces internal heat gains and overall electricity demand.
	55.44 kWh/m²	• Staggered block orientation enhances self-shading and reduces direct solar exposure, especially on façades. • Courtyard-like spatial arrangement improves wind movement through and between blocks, strengthening cross-ventilation. • Classrooms and circulation spaces operate under passive cooling, while air-conditioning is limited to laboratories only. • Adoption of daylight-responsive LED lighting and efficient electrical equipment lowers artificial lighting demand and internal loads.
	39.66 kWh/m²	• Optimized block orientation minimizes heat gain by reducing exposed surface area and promoting mutual shading. • Compact massing and aligned openings create efficient wind corridors, ensuring strong cross-ventilation across learning spaces. • Complete reliance on natural ventilation for non-lab spaces, eliminating air-conditioning loads except where functionally required. • Integration of high-efficiency lighting systems, low-energy appliances, and controlled usage schedules significantly reduces annual energy consumption, achieving the lowest EPI.

table 5.2. Energy Reduction Strategies for Simple Box Models

PRELIMINARY WATER CYCLE DIAGRAM

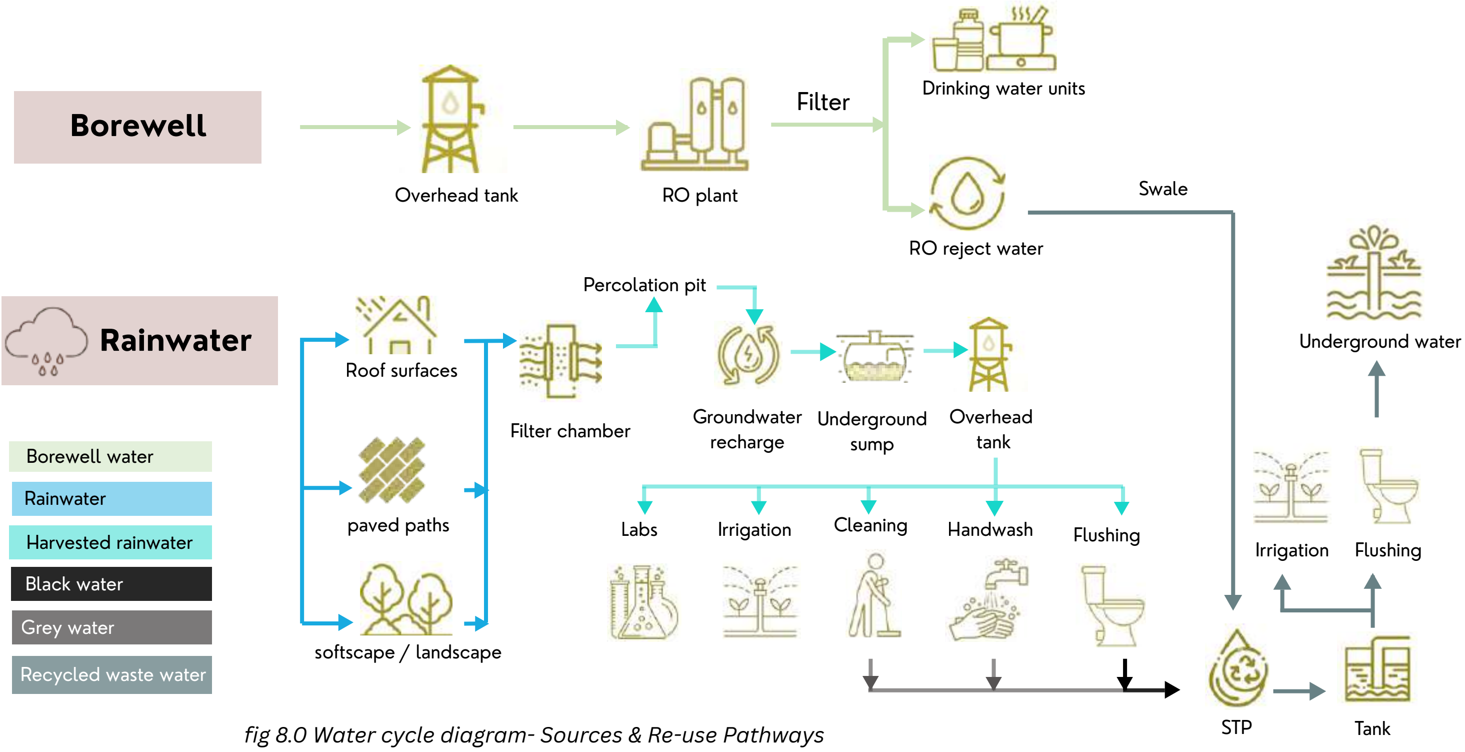


fig 8.0 Water cycle diagram- Sources & Re-use Pathways

PRELIMINARY WATER CONSUMPTION CALCULATIONS

USE	% OF TOTAL	LITRES/ DAY	WASTEWATER TYPE
TOILET FLUSHING	40%	24,000	BLACK WATER
HANDWASH & DRINKING	25%	15,000	GREY WATER
CLEANING & WASHING	20%	12,000	GREY WATER
GARDENING (FRESH WATER)	15%	9,000	NO WASTE WATER
TOTAL	100%	60,000	-

table 6.1. Water Consumption per day

ESTIMATED WATER CONSUMPTION

- The daily water requirement of the school is estimated based on user strength and standard per capita consumption norms.
- With 1,200 students consuming 45 litres per day, the student water demand is 54,000 litres/day. Additionally, 90 staff members require 70 litres per day, amounting to 6,300 litres/day.
- Hence, the total daily water consumption of the school is 60,300 litres per day, covering drinking, sanitation, handwashing, cleaning, and other routine campus activities.

ESTIMATED RAINWATER CATCHMENT AREA

- Rainwater harvesting systems used are roof-based collection systems for storage and reuse, surface runoff collection from paved areas, and groundwater recharge through percolation from landscaped zones, ensuring efficient capture, reuse, and recharge of rainwater across the site.

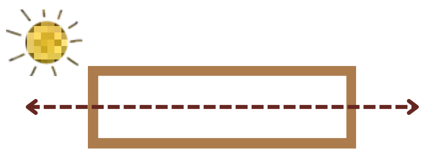
SURFACE AREA (M^2)	AREA (M^2)	RUNOFF COEFFICIENT (C)	EFFECTIVE CATCHMENT AREA (M^2)
ADMIN BLOCK ROOF	1,115	0.8	892
ACADEMIC BLOCK ROOF (PRIMARY)	1,831	0.8	1,465
ACADEMIC BLOCK ROOF (SECONDARY)	1,436	0.8	1,149
TOTAL ROOF AREA	4,382	-	3,506
HARDSCAPE (PATHS/COURTS/ROADS)	3,500	0.6	2,100
SOFTSCAPE (LAWNS/GARDENS)	5,000	0.25	1,250

table 6.2. Effective Catchment Area of Rainwater

DESIGN IDEAS WITH PROS AND CONS

DESIGN ITERATION- OPTION 01

FORM DEVELOPMENT



1. The design starts with a simple rectangular mass, ensuring planning efficiency but limiting daylight and ventilation.
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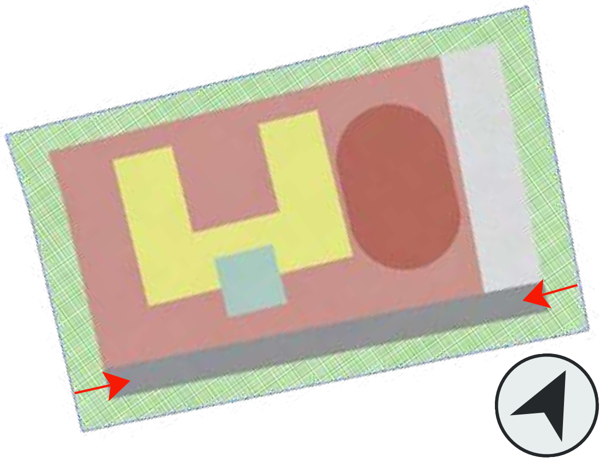
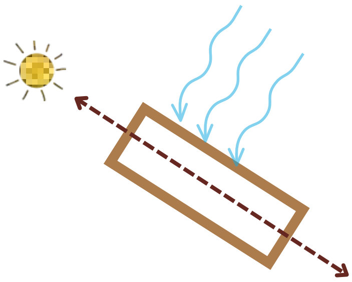
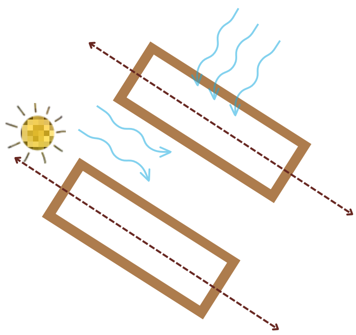


SITE ZONING

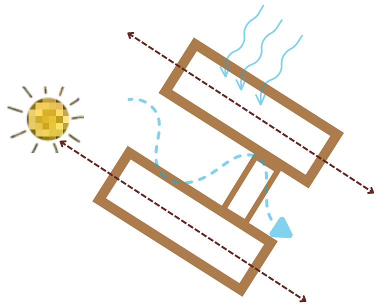
- ACADAMIC BLOCK
- ADMINISTRATIVE BLOCK
- PLAYGROUND
- FOOTBALL GROUND
- PARKING
- ROAD



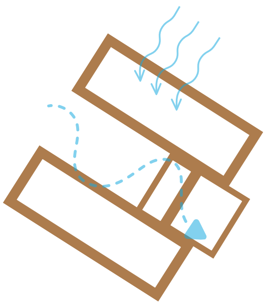
2. The block is rotated along the east–west axis to reduce solar heat gain and align with prevailing winds, forming the climatic basis of the design.



3. The mass is split into two parallel blocks to reduce depth and improve daylight, ventilation, and visual openness.



4. The blocks bend inward and connect to form a C-shape, creating a central courtyard as the campus core.



5. TThe final C-shaped form creates a protected microclimate, buffers edge noise, enhances daylight and ventilation, and establishes a strong campus identity.

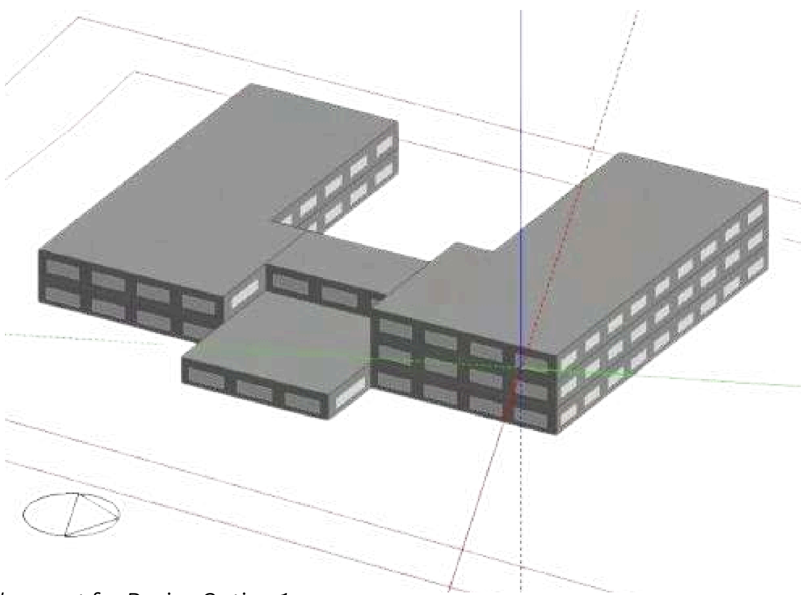
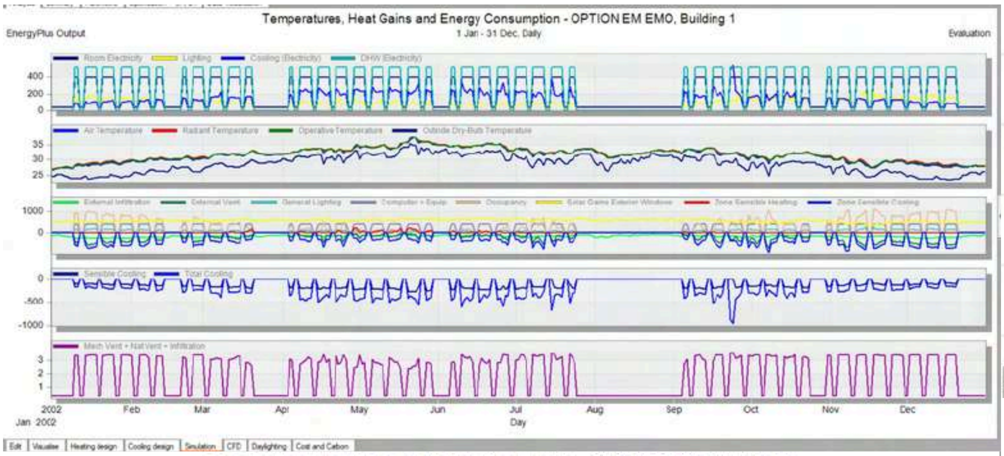


fig 9.1 Form Development for Design Option-1

ENERGY SIMULATIONS



Temperatures, Heat Gains and Energy Consumption - OPTION EM EMO, Building 1

EnergyPlus Output — 1 Jan - 31 Dec, Daily — Evaluation

Day										
Room Electricity (kWh)	33.92	395.45	395.45	33.92	395.45	395.45	33.92	33.92	33.92	395.45
Lighting (kWh)	0.00	106.45	121.78	0.00	87.34	104.97	0.00	0.00	0.00	160.04
Cooling (Electricity) (kWh)	0.00	177.10	228.00	0.00	234.53	172.83	0.00	0.00	0.00	129.57
DHW (Electricity) (kWh)	0.00	510.10	510.10	0.00	510.10	510.10	0.00	0.00	0.00	510.10
Air Temperature (°C)	29.58	31.80	33.41	34.05	34.64	32.65	32.04	31.97	32.19	29.50
Radiant Temperature (°C)	29.97	31.96	33.39	34.39	34.65	32.60	32.11	32.22	32.52	29.80
Operative Temperature (°C)	29.77	31.88	33.40	34.22	34.65	32.62	32.08	32.10	32.35	29.65
Outside Dry-Bulb Temperature (°C)	25.98	28.86	31.03	30.73	32.08	29.86	30.86	29.47	29.09	26.17
External Infiltration (kWh)	-190.58	-155.32	-126.30	-175.19	-134.85	-146.59	-62.10	-130.43	-163.85	-175.28
External Vent. (kWh)	0.00	-207.75	-117.32	0.00	-102.27	-123.56	0.00	0.00	0.00	-361.49
General Lighting (kWh)	0.00	106.45	121.78	0.00	87.34	104.97	0.00	0.00	0.00	160.04
Computer + Equip (kWh)	33.92	395.45	395.45	33.92	395.45	395.45	33.92	33.92	33.92	395.45
Occupancy (kWh)	0.00	381.29	146.36	0.00	89.75	249.01	0.00	0.00	0.00	741.81
Solar Gains Exterior Windows (kWh)	533.88	518.97	568.28	551.13	656.30	584.95	617.09	561.19	534.92	520.88
Zone Sensible Heating (kWh)	0.00	19.38	47.27	0.00	56.71	25.64	0.00	0.00	0.00	0.06
Zone Sensible Cooling (kWh)	0.00	-382.48	-299.55	0.00	-296.85	-301.00	0.00	0.00	0.00	-525.05
Sensible Cooling (kWh)	0.00	-177.48	-203.76	0.00	-218.42	-193.33	0.00	0.00	0.00	-135.04
Total Cooling (kWh)	0.00	-318.79	-410.40	0.00	-422.15	-311.09	0.00	0.00	0.00	-233.23
lech Vent + Nat Vent + Infiltration (ac/h)	0.33	3.10	2.87	0.33	2.92	3.05	0.33	0.33	0.33	3.39

fig 9.2. Energy Simulations for Design Option-1

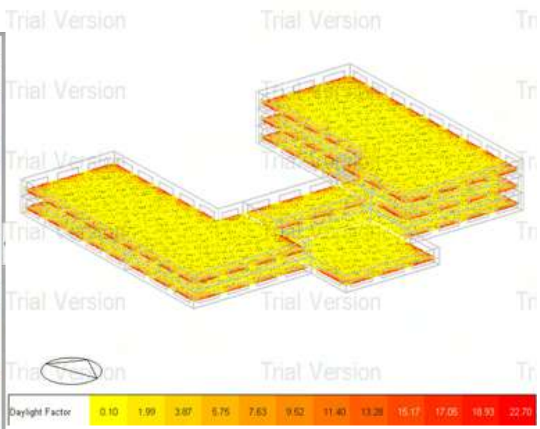


fig 9.3. Daylighting for Design Option-1

DAYLIGHTING ANALYSIS

- Daylight is well distributed across the building, with higher levels along the perimeter.
- The massing allows daylight penetration from multiple sides, improving interior illumination.
- Overall daylight levels support visual comfort and reduced dependence on artificial lighting.

SUNPATH & SHADOW ANALYSIS

- Horizontal overhangs work best on South
- East & West need vertical / deeper shading
- North needs minimal shading
- Recommended Sunshade Lengths (Direction-Wise): South-Facing Windows
- Goal: Block high summer sun, allow winter sun
- Use horizontal RCC / metal overhangs

ORIENTATION	TYPE OF SHADING	RECOMMENDED PROJECTION
South	Horizontal overhang	600–750 mm
East	Overhang + fins	600 mm + 300–450 mm fins
West	Deep overhang / fins	900–1200 mm
North	Minimal	300–450 mm

table 7.0. Strategies from Shadow Analysis

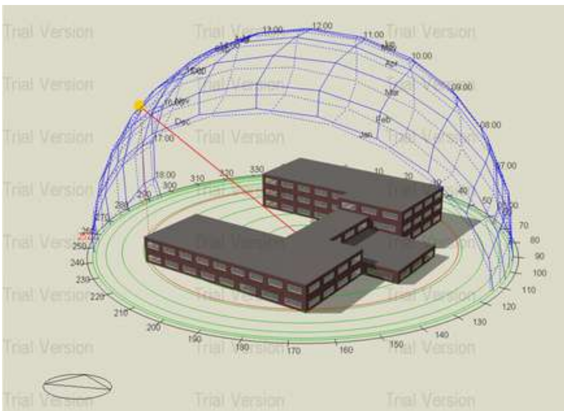


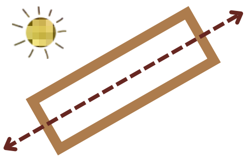
fig 9.4. Sun path for Design Option-1

INFERENCES

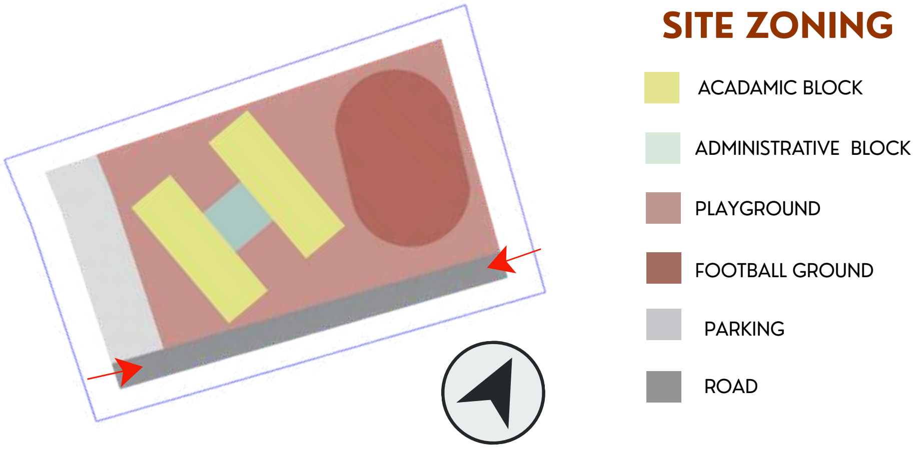
Sunshade dimensions were derived from site-specific sun-path analysis. Horizontal overhangs were designed based on critical summer solar angles to block high-altitude sun while allowing winter penetration. East and west façades employ deeper shading and vertical elements to mitigate low-angle solar gain. This approach reduces cooling loads while maintaining adequate daylight.

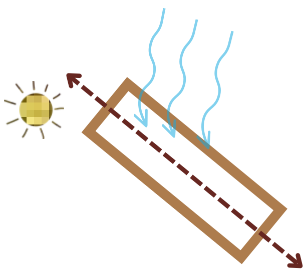
DESIGN ITERATION - OPTION 02

FORM DEVELOPMENT

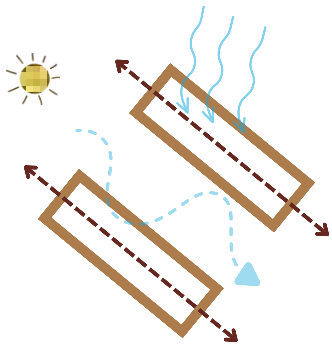


1 The form begins as a simple linear academic block shaped by site geometry and space needs, offering efficiency but limited daylight and natural ventilation.

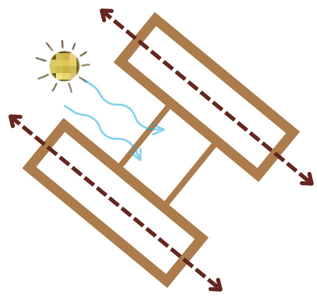




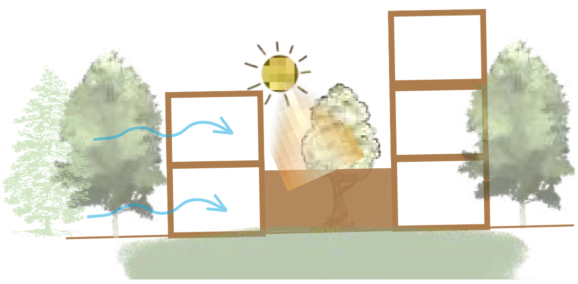
2 The block is oriented along the east–west axis to reduce solar gain and capture prevailing winds, forming the climatic basis of the design.



3 The mass is divided into two parallel linear blocks to reduce depth, enhance daylight, and enable cross-ventilation.



4 The two bars are linked by a central block to form an H-shaped layout, creating semi-open courts that improve ventilation, visual connectivity, and shaded spill-out spaces.



5 The H-shaped form creates shaded courtyards, clear academic zoning, and a central interaction spine, ensuring self-shading and thermal comfort with landscaped courts.

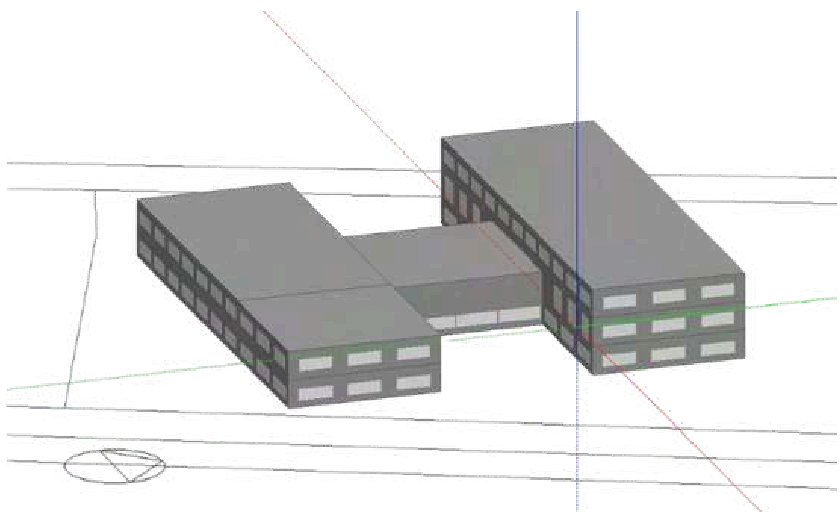


fig 10.1 Form Development for Design Option-2

ENERGY SIMULATIONS

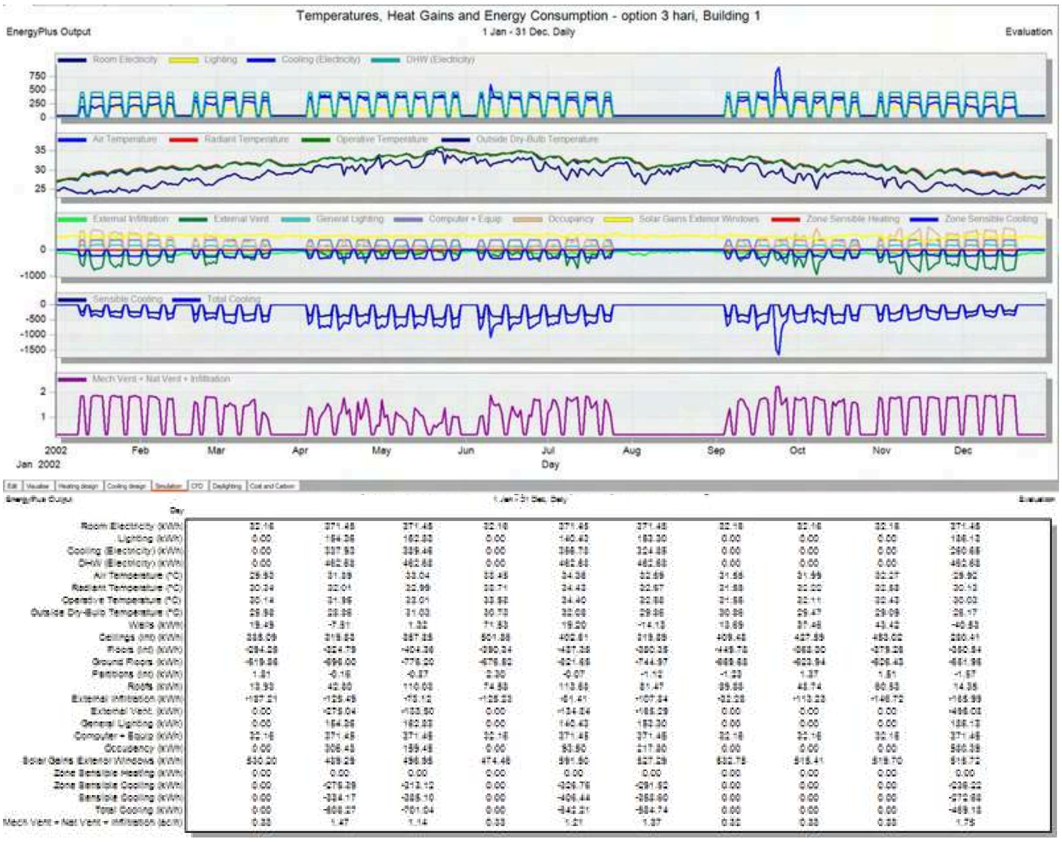


fig 10.2. Energy Simulations for Design Option-2

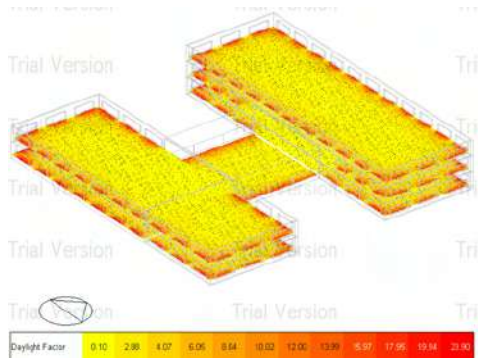


fig 10.3.Daylighting for Design Option-2

DAYLIGHTING ANALYSIS

- Daylight is uniform across floors, with higher levels near façades.
- Edge and courtyard zones receive effective daylight, reducing artificial lighting.
- Overall conditions ensure visual comfort with minimal glare.

SUNPATH & SHADOW ANALYSIS

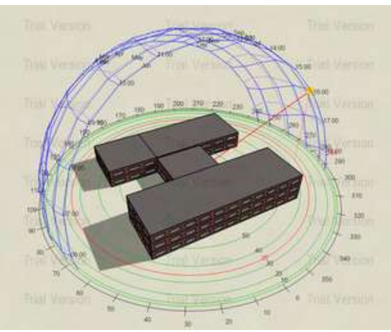


fig 10.4.Sun path for Design Option-2

Key Design Strategies (Summary):

- Orient building east–west to minimize heat gain.
- Use self-shading massing and horizontal overhangs for sun control.
- Add vertical fins/screens on east and west façades.
- Maximize north–south openings for uniform daylight.
- Shade roofs and outdoor spaces with pergolas or green roofs.
- Locate service areas on east–west sides as thermal buffers.

PROS AND CONS

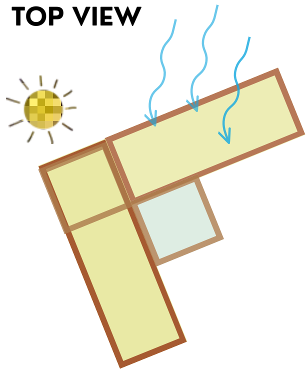
ASPECT	PROS	CONS
Stepped Height (G+1 + G+2)	Improves air movement and reduces heat buildup; safer and more child-friendly	Requires careful structural and fire-escape coordination
Clustered Block Form	Enhances cross-ventilation and daylight from multiple sides	Increases circulation area compared to a compact block
Orientation (Near East–West)	Minimizes solar heat gain on longer façades; improves thermal comfort	East & west ends still need strong shading for low-angle sun
Multiple Roof Levels	Provides flexibility for solar PV and rainwater harvesting	Slightly higher waterproofing and maintenance effort
Inter-Block Open Spaces	Creates shaded spill-out zones and improves site microclimate	Needs proper rain protection during monsoon

table 8.0. Pros & Cons for Design Option-02

DESIGN ITERATION-OPTION 03

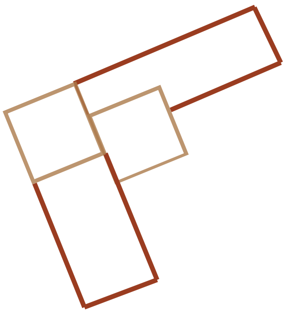
FORM DEVELOPMENT

TOP VIEW



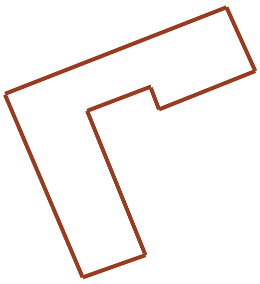
The design begins by identifying academic, laboratory, and administrative blocks, developed as simple linear volumes based on spatial needs and circulation.

GROUND FLOOR



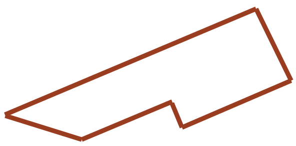
The ground-floor form begins with academic, laboratory, and administrative blocks developed as independent linear volumes.

FIRST FLOOR

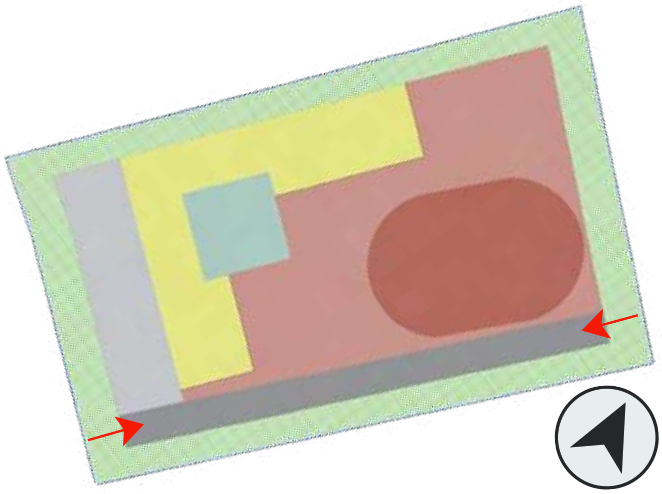


The first floor continues the L-shaped form with two academic blocks, strengthening the academic spine and internal connectivity.

SECOND FLOOR



The second floor reduces to a linear academic volume, creating terraces and stepped massing for self-shading and improved daylight and ventilation



SITE ZONING

- ACADAMIC BLOCK
- ADMINISTRATIVE BLOCK
- PLAYGROUND
- FOOTBALL GROUND
- PARKING
- ROAD

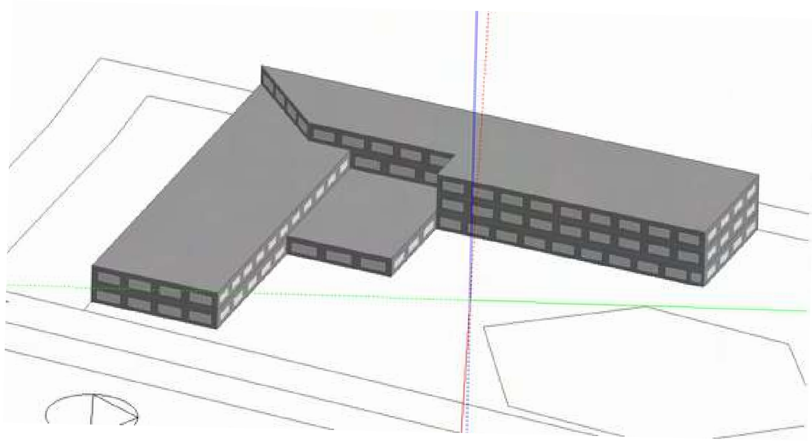


fig 11.1 Form Development for Design Option-3

ENERGY SIMULATIONS

Temperatures, Heat Gains and Energy Consumption - OPTION 5 LEHA, Building 1

1 Jan - 31 Dec, Daily

EnergyPlus Output — Evaluation

Day										
Room Electricity (kWh)	47.78	553.92	553.92	47.78	553.92	553.92	47.78	47.78	47.78	553.92
Lighting (kWh)	0.00	151.21	173.92	0.00	113.88	148.78	0.00	0.00	0.00	225.59
Cooling (Electricity) (kWh)	0.00	189.15	217.38	0.00	223.56	179.67	0.00	0.00	0.00	141.28
DHW (Electricity) (kWh)	0.00	704.31	704.31	0.00	704.31	704.31	0.00	0.00	0.00	704.31
Air Temperature (°C)	29.38	31.79	33.35	33.77	34.55	32.56	31.66	31.76	32.01	29.40
Radiant Temperature (°C)	29.71	31.88	33.23	34.04	34.45	32.37	31.66	31.95	32.27	29.58
Operative Temperature (°C)	29.55	31.83	33.29	33.91	34.50	32.46	31.66	31.85	32.14	29.49
Outside Dry-Bulb Temperature (°C)	25.98	28.86	31.03	30.73	32.08	29.86	30.86	29.47	29.09	26.17
External Infiltration (kWh)	-228.93	-195.28	-153.53	-200.43	-162.29	-178.41	-53.30	-150.53	-194.44	-216.84
External Vent. (kWh)	0.00	-284.80	-160.88	0.00	-135.83	-162.71	0.00	0.00	0.00	-476.95
General Lighting (kWh)	0.00	151.21	173.92	0.00	113.88	148.78	0.00	0.00	0.00	225.59
Computer + Equip (kWh)	47.78	553.92	553.92	47.78	553.92	553.92	47.78	47.78	47.78	553.92
Occupancy (kWh)	0.00	523.40	197.52	0.00	124.14	348.95	0.00	0.00	0.00	1038.80
Solar Gains Exterior Windows (kWh)	620.56	646.68	695.92	671.81	806.14	712.56	779.14	684.18	647.00	602.28
Zone Sensible Heating (kWh)	0.00	24.71	66.26	0.00	82.92	38.23	0.00	0.00	0.00	1.19
Zone Sensible Cooling (kWh)	0.00	-480.21	-351.33	0.00	-331.60	-343.29	0.00	0.00	0.00	-680.56
Sensible Cooling (kWh)	0.00	-175.81	-204.07	0.00	-216.92	-187.77	0.00	0.00	0.00	-138.17
Total Cooling (kWh)	0.00	-340.46	-391.28	0.00	-402.41	-323.40	0.00	0.00	0.00	-254.31
Mech Vent + Nat Vent + Infiltration (ac/h)	0.30	3.11	2.91	0.30	2.87	3.00	0.30	0.30	0.30	3.36

fig 11.2. Energy Simulations for Design Option-3

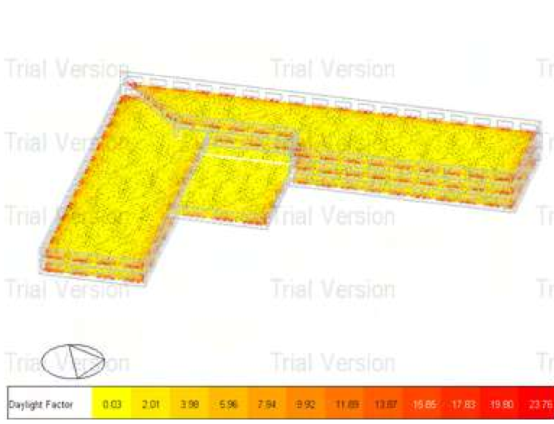


fig 11.3.Daylighting for Design Option-3

DAYLIGHTING ANALYSIS

- Daylight is consistently distributed across the floor plates, with higher intensity along façades.
- The building form enables effective daylight penetration into internal zones.
- Overall lighting conditions support visual comfort and reduced need for artificial lighting.

SUNPATH & SHADOW ANALYSIS

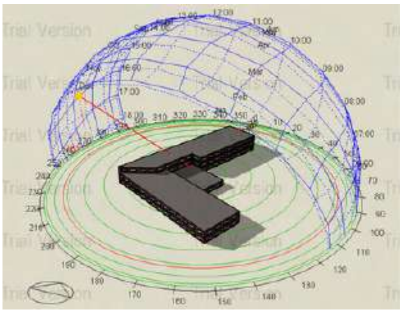


fig 11.4.Sun path for Design Option-3

- The sun follows an east–west path with a high noon altitude, resulting in minimal shadows at mid-day.
- Morning and evening sun create longer shadows, mainly towards the north and northeast.
- The L-shaped massing provides self-shading, especially within the inner court.
- Shaded zones improve thermal comfort and reduce direct solar heat gain.

PROS AND CONS

Aspect	Pros	Cons
Stepped L-shaped Form	Breaks down the building scale, reducing visual bulk and making it	Internal corners may trap heat if not well ventilated
Self-shading by Massing	Projections and offsets provide partial façade	Limited effectiveness during low-angle
Central Connector Block	Acts as a buffer and smooth transition	Can become heat-prone without proper
Roof Continuity	Large uninterrupted roof areas suitable for solar	Taller wing may cast shadows on lower
Orientation of Openings	Multiple facades allow cross-ventilation	Openings on exposed sides

table 9.0. Pros & Cons for Design Option-03

SUNPATH & SHADOW ANALYSIS

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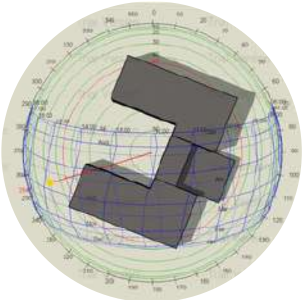
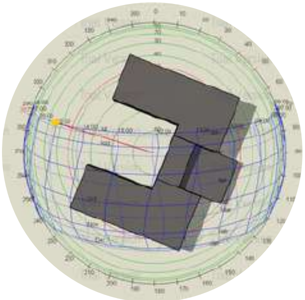
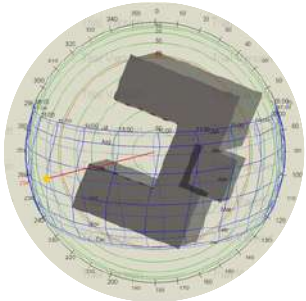
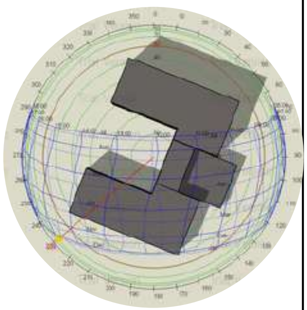
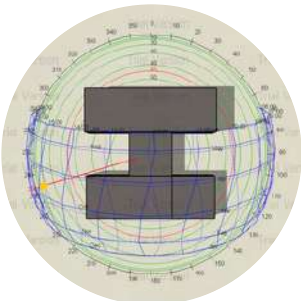
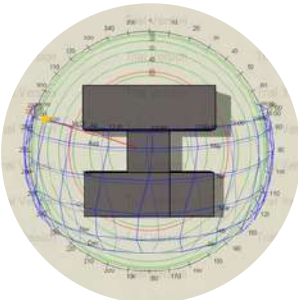
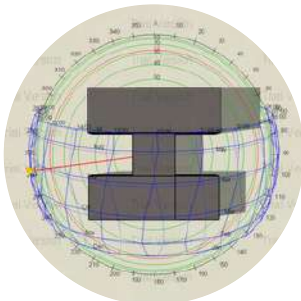
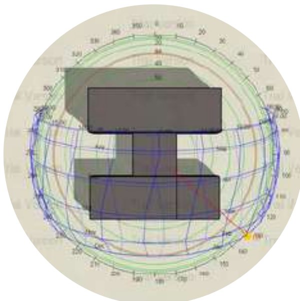
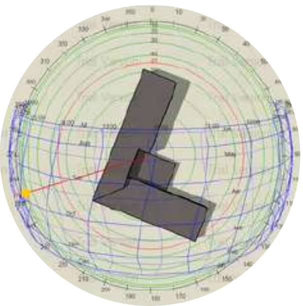
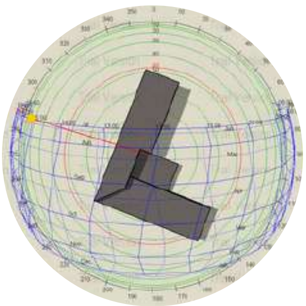
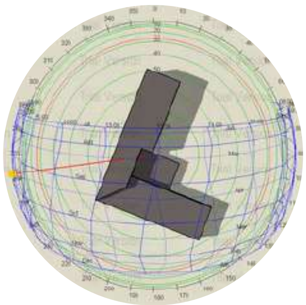
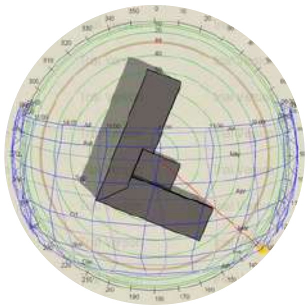
OPTION 1				
OPTION 2				
OPTION 3				

table 10.1. Sun path Analysis for Design Options

Option	Solar/Shading Analysis
Option 1	Angled massing provides partial self-shading, but large façades still receive significant solar exposure during summer and equinox afternoons.
Option 2	Symmetrical, linear form shows uniform sun exposure with limited self-shading, leading to higher overall solar gain across seasons.
Option 3	Compact rotated form reduces direct solar incidence on major façades, offering comparatively better shading performance throughout the year.

table 10.2. Solar Analysis for Design Options

sthapati
architects

Date: 12-01-2026

To,
The Director,
Solar Decathlon India
Dear Sir,

This is to inform you that our organization, STHAPATI ARCHITECTS, has provided information about our GOOD SHEPHERD SCHOOL PROJECT to the participating team led by JAWAHARLAL NEHRU ARCHITECTURE AND FINE ARTS UNIVERSITY, so that their, TEAM TATTVA, led by POOJA NANDIGAM, may use this information for their SDI 2025-26 Challenge entry. As a Project Partner to this team for the SDI 2025-26 Challenge, we are interested in seeing the Net-Zero-Energy, Net-Zero-Water, resilient and affordable solution this student team proposes and the innovation that results from this.

We recognize that developing net-zero buildings may require out-of-the box solutions and we will encourage the team throughout their journey in the SDI competition to challenge the current norms of design, construction, and real estate practices in our project.

We would like to have a representative from our organization attend the SDI Finals event in June, if this team is selected for the finals.

We would like our organization's logo to be displayed on the SDI website, recognizing us as a Project Partner of the 2025-26 Challenge.

We would like our contact information to be shared with Design-Builder Australia and IES India, who provide energy simulation software to student teams in the SDI Challenge.
With warm regards,

Name of Representative: Ar.Nilesha k,
Designation: Sr.Architect
Email:ar.nilesha.sthapati@gmail.com
Phone: 9160984433

STHAPATI ARCHITECTS
architecture + interiors

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