21ARC81

# ARCHITECTURAL DESIGN - 8

NAME : BIPIN ACHAPPA N M
USN : 1AA21AT012
SEM : 08
COLLEGE : ANRVSA

# LITERATURE CASE STUDY

## PRIMARY HEALTHCARE CENTER , DHARMAPURI, TAMIL NADU

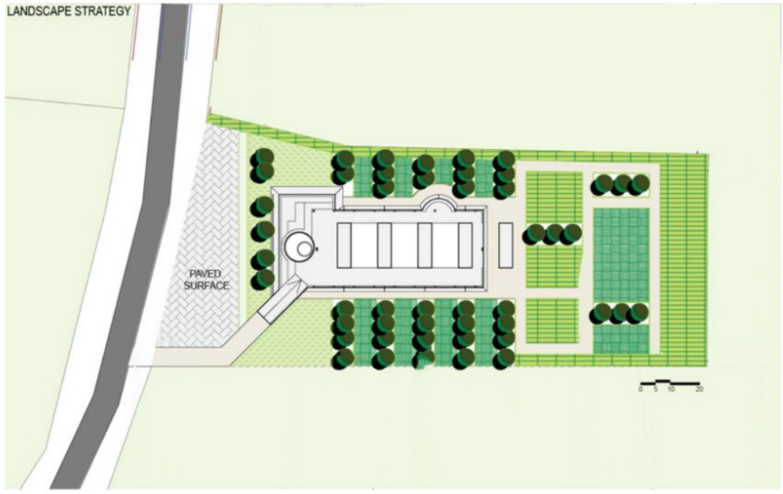
### INTRODUCTION:

THIS PROJECT, 20KM WEST OF DHARMAPURI IN TAMIL NADU, LIES IN THE SOUTHERNMOST PART OF THE INDIAN PENINSULA. WITH A LOW BUDJET, THE PROJECT SERVES TO IMPROVE HEALTHCARE IN THIS HOT AND SEMI-ARID RURAL REGION. THE COMPACTAND SMALL-SCALE BUILDING DISTINGUISHES BETWEEN A HIGHTECH MEDIAL CORE AND A LOW-TECH SUPPORTING LAYER.
THE BUILDING IS REPORTED TO BE FUNCTIONING WELL.

**DESIGNED BY:** FLYING ELEPHANT STUDIO: AR.NEHA GUPTA, AR.KIRAn CHANDRA, AR. RAJESH RENGANATHAN

**CONSTRUCTION:** SEPTEMBER 2011

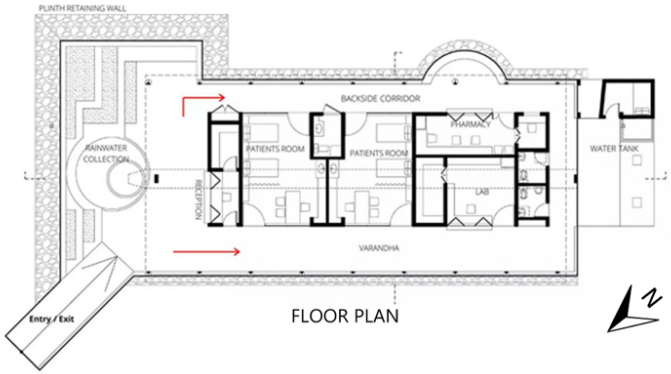
**LOCATION:** DHARMAPURI, TAMIL NADU, INDIA




SITE PLAN

- STRONG FOCUS IS LAID ON THE EFFICACY OF SIMPLE AND LOCAL MATERIALS, WHOSE CHARACTERISTICS
- ARE WELL-CONSIDERED IN THEIR SPECIFIC APPLICATION.
- THE ROOF CONSISTS OF RECYCLED TETRAPAK CONTAINERS, BASE WALLS ARE MADE OF RUBBLE STONES,
- SHADE SCREENS ARE MANUFACTURED USING A LOCAL VARIETY OF VETIVER GRASS WHICH IS MOISTENED TO CREATE AN EVAPORATIVE COOLING EFFECT DURING THE SEVERE DRY TROPICAL SUMMER.
- RAINWATER IS COLLECTED AND USED FOR WATER EFFICIENT IRRIGATION.
- THE GREEN AND NATURE FRIENDLY BUILDING IS THE MAIN FEATURE OF THIS PROJECT.
- VERY LOW COST CONSTRUCTION
- WEATHER TIGHT.
- SIMPLE AND COMPACT.

### FLOOR PLAN :

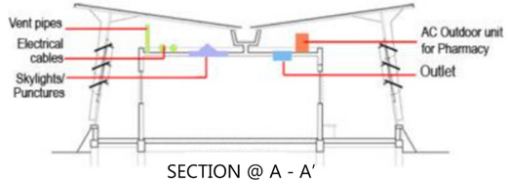



FLOOR PLAN

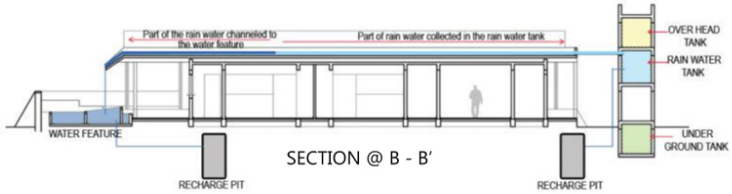
### DESIGN STRATEGY & SPATIAL PLANNING :

LINEAR FOOTPRINT: COMPACT, ELONGATED LAYOUT PROMOTES DAYLIGHT AND EXTENSIVE CROSS-VENTILATION.
LAYERED SHELL CONCEPT:
CORE CLINIC BLOCK – ENCLOSED, WEATHER-TIGHT, STERILE, BUILT TO FORMAL MEDICAL STANDARDS.
WRAP-AROUND VERANDA – DOUBLE-SKIN BUFFER WITH NATURAL VENTILATION.
LANDSCAPE RING – TERRACES WITH MEDICINAL PLANTS REINFORCE LOCAL ECOLOGY.

### SECTIONS :



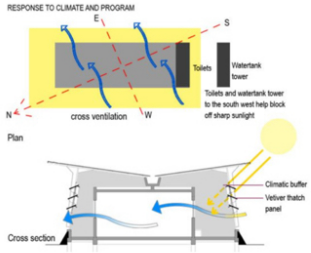

SECTION @ A - A'



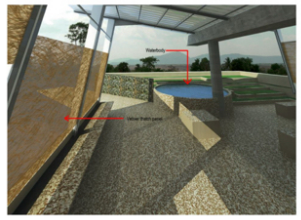

SECTION @ B - B'

### CLIMATE-RESPONSIVE FEATURES :

EVAPORATIVE COOLING: OUTER SCREENS USE VETIVER GRASS THATCH TO MOISTEN INCOMING AIR, REDUCING TEMPERATURE AND DUST. OPERABLE PANELS ALLOW SEASONAL CONTROL.
ROOF & RAINWATER MANAGEMENT: CORRUGATED GALVANIZED STEEL ROOF CHANNELS RAIN INTO A CENTRAL GUTTER-BEAM. THIS ELIMINATES WATERPROOFING COSTS, COLLECTS WATER FOR RECHARGE/STORAGE, AND PROVIDES AN



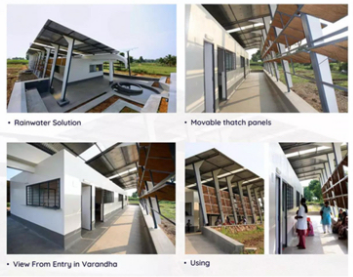

### MATERIALS :

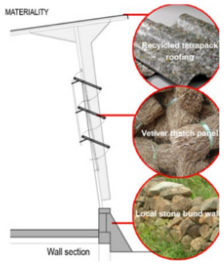


HYBRID STRUCTURE:

PORTAL FRAMES USE SLENDER STEEL ANGLES WITH FLY-ASH CEMENT FIBERBOARD COMPOSITE—OPTIMIZING STRENGTH AND MINIMIZING STEEL USE.
PLINTH MADE OF LOCAL RUBBLE STONE ANCHORS THE BUILDING VISUALLY AND RESISTS DUST.
LOCAL CRAFTSMANSHIP & TRAINING: A CORE TEAM OF SKILLED ARTISANS COLLABORATED WITH LOCAL LABOR, ENHANCING QUALITY AND TRANSFERRING SKILLS.

LAWNS MEDICINAL HERBS ORCHARDS GRASS SHURBS



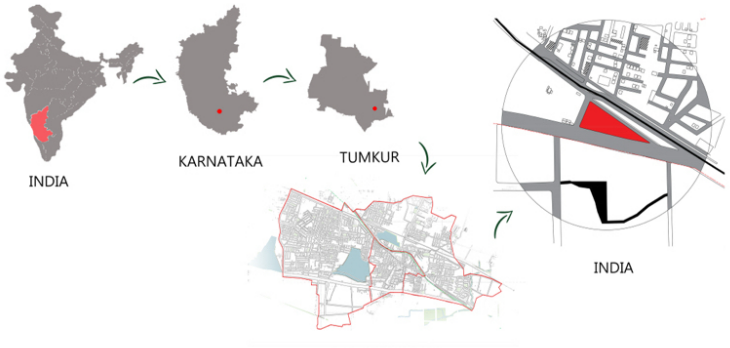




### VIEWS :

# SITE ANALYSIS

INDIVIDUAL PROJECT

LOCATION : WARD 34, KYATHSANDRA, NEAR SIDDHAGANGA MATTA, TUMAKURU, KARNATAKA, 572104.




## PROXIMITY :

**KYATSANDRA RAILWAY STATION (KIAT) :** APPROXIMATELY 1.40 KM FROM PROPOSED SITE, THIS IS THE CLOSEST RAILWAY STATION, OFFERING CONVENIENT ACCESS FOR TRAVELERS.

**TUMKUR RAILWAY STATION (TK) :** SITUATED ABOUT 7 KM FROM PROPOSED SITE, TUMKUR RAILWAY STATION IS A MAJOR HUB WITH FREQUENT TRAIN SERVICES.

**KYATSANDRA BUS STOP :** 1 KM FROM PROPOSED SITE, THIS STOP IS SERVED BY KSRTC BUSES, PROVIDING EASY ACCESS FOR VISITORS.

**TUMKUR KSRTC BUS STAND :** APPROXIMATELY 7 KM FROM THE PROPOSED SITE, THIS CENTRAL BUS STATION OFFERS NUMEROUS ROUTES CONNECTING TUMAKURU WITH OTHER CITIES, INCLUDING BENGALURU.

## MAJOR LANDMARKS:

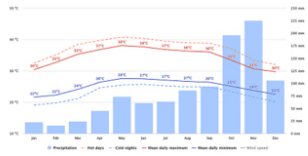
SIDDAGANGA MATHA

KYATSANDRA RAILWAY STN.

NH - 4
KYATSANDRA BUS STOP

## CLIMATE ANALYSIS :

- TUMAKURU HAS A TROPICAL SAVANNA CLIMATE WITH HOT SUMMERS, MODERATE RAINFALL, AND MILD WINTERS.
- **TEMPERATURE:** 15°C TO 39°C ANNUALLY; APRIL IS THE HOTTEST MONTH.
- **RAINFALL:** 700–900 MM/YEAR, MAINLY DURING THE SOUTHWEST MONSOON (JUNE–SEPTEMBER).
- **HUMIDITY:** RANGES FROM 35% TO 85%, HIGHER DURING MONSOON MONTHS.
- **WIND:** PREDOMINANTLY SOUTHWEST WINDS DURING MONSOON; NORTHEAST WINDS IN DRY MONTHS.
- **SOLAR EXPOSURE:** HIGH THROUGHOUT THE YEAR,

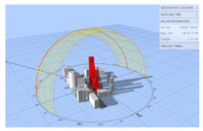


## NATURAL FEATURE OF THE SITE :

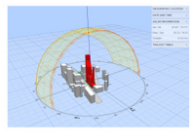
THE SITE IS CURRENTLY OVERGROWN WITH UNPLANNED VEGETATION, INCLUDING RANDOM PLANTS, SHRUBS, AND BUSHES.

**SOIL TYPE:** RED LOAMY SOILS
**SITE AREA:** 11,011SQM OR 2.72 ACRES
**TOPOGRAPHY :** 842 M

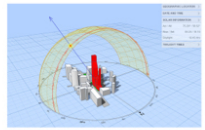
## SUN ANGLE THROUGHOUT THE YEAR :



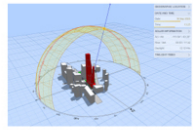
JAN - MARCH



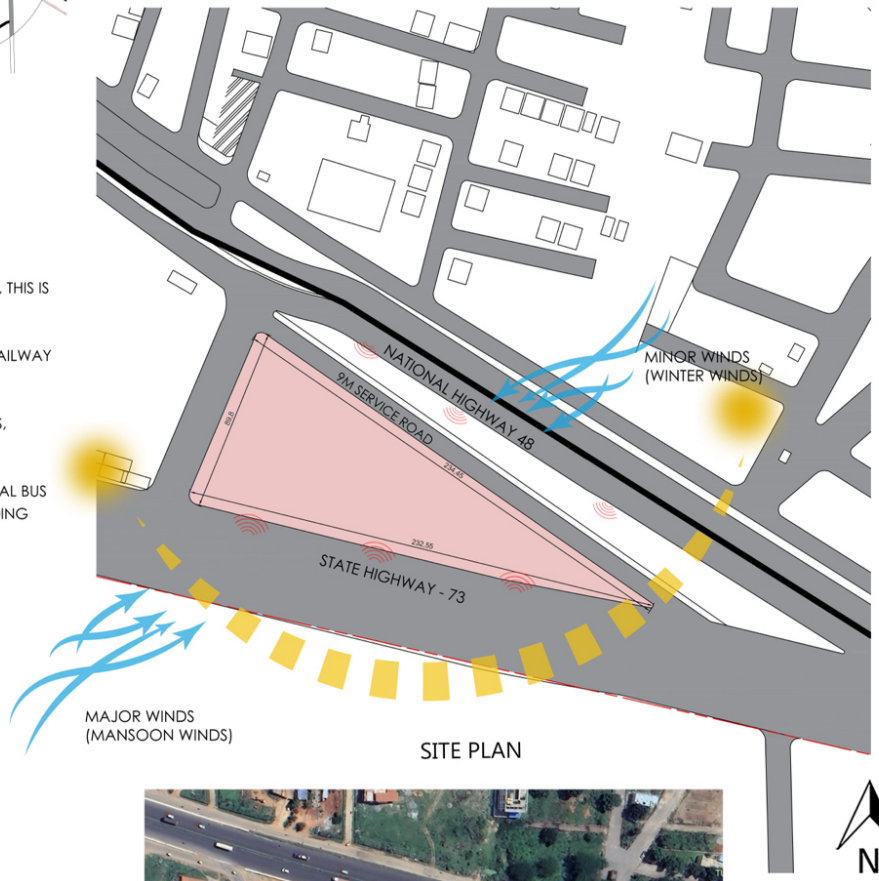
APRIL - JUNE



JULY - SEP



OCT - DEC




SITE PLAN

OPEN, UNDEVELOPED LAND: THE AREA REMAINS LARGELY UNUSED, WITH NO SIGNIFICANT BUILT STRUCTURES OR ACTIVE LAND USE.

**SUN PATH -** THE SUN MOVES FROM EAST TO WEST, FOLLOWING A PATH THAT ARCS ACROSS THE SOUTHERN SKY IN THIS REGION.

**MAJOR WINDS -** BLOW FROM THE SOUTH-WEST DURING THE MONSOON (JUNE–SEPTEMBER), BRINGING RAIN.
**MINOR WINDS -** COME FROM THE NORTH-EAST IN WINTER (OCTOBER–FEBRUARY), AND ARE DRY AND COOL.

## CONTEXTUAL SENSORY OVERVIEW

**NOISE:** THE SITE CONECTING BOTH NH-48 AND SH-73 AND FACES CONSTANT TRAFFIC NOISE FROM HEAVY VEHICLES, WITH ENGINE SOUNDS, HONKING, AND TIRE NOISE DOMINATING. HIGHWAY NOISE OVERSHADOWS ANY MINOR URBAN BACKGROUND SOUNDS.

**SCENT:** THE SITE'S SCENT ENVIRONMENT IS DOMINATED BY VEHICLE EXHAUST FROM NH-48 AND SH-73, WITH OCCASIONAL DIESEL FUMES AND DUST, ESPECIALLY IN DRY SEASONS. NATURAL AROMAS FROM TREES AND OCCASIONAL FOOD SMELLS FROM NEARBY VENDORS PROVIDE SOME CONTRAST IN SHELTERED AREAS.

## SWOT ANALYSIS

### STRENGTH

HIGH VISIBILITY: **NH-48 FRONTAGE OFFERS STRONG COMMERCIAL EXPOSURE.**
**EASY ACCESSIBILITY:** CONVENIENT FOR BOTH LOCALS AND HIGHWAY TRAFFIC.
**FLAT TOPOGRAPHY:** FACILITATES COST-EFFECTIVE CONSTRUCTION.
**URBAN GROWTH ZONE:** POSITIONED IN TUMAKURU'S EXPANDING DEVELOPMENT CORRIDOR.

### WEAKNESS

**NOISE POLLUTION:** CONSTANT NH-48 TRAFFIC NOISE MAY AFFECT COMFORT; REQUIRES SOUND MITIGATION.
**LIMITED TRANSIT ACCESS:** POOR PUBLIC TRANSPORT CONNECTIVITY MAY HINDER PEDESTRIAN ACCESS.

### OPPORTUNITIES

**COMMERCIAL GROWTH POTENTIAL:** IDEAL FOR RETAIL OUTLETS, HIGHWAY SERVICES, FOOD COURTS, OR MIXED-USE DEVELOPMENTS.
**FUTURE URBAN EXPANSION:** AS TUMAKURU EXPANDS, THE SITE'S VALUE AND UTILITY FOR COMMERCIAL USE ARE EXPECTED TO GROW.

### THREATS

**AIR AND NOISE POLLUTION:** PROXIMITY TO HIGHWAY COULD DETER CERTAIN USER GROUPS UNLESS MITIGATED THROUGH THOUGHTFUL DESIGN.
**ENVIRONMENTAL EXPOSURE:** DUST, HEAT, AND WIND EXPOSURE COULD IMPACT USER COMFORT WITHOUT PROPER CLIMATIC DESIGN STRATEGIES.

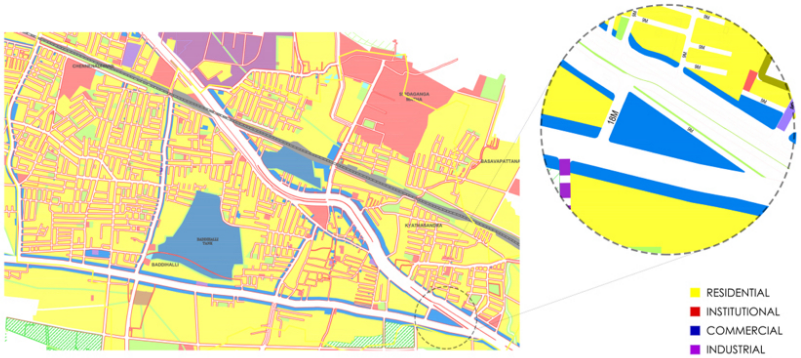
## INFERENCE

THE SITE ALONG NH-48 OFFERS STRONG POTENTIAL FOR COMMERCIAL DEVELOPMENT DUE TO ITS HIGH VISIBILITY, EASY ACCESS, AND LOCATION WITHIN TUMAKURU'S GROWING URBAN EDGE. WHILE ISSUES LIKE NOISE, UNMANAGED VEGETATION, AND LIMITED TRANSIT EXIST, THEY CAN BE ADDRESSED WITH SMART PLANNING. ITS FLAT TERRAIN AND HIGHWAY EXPOSURE MAKE IT IDEAL FOR RETAIL OR MIXED-USE PROJECTS, WITH SCOPE FOR A SUSTAINABLE, WELL-INTEGRATED COMMERCIAL HUB.

# INDIVIDUAL PROJECT

## SITE JUSTIFICATION, CONCEPT , ZONING AND AREA PROGRAM

### SITE JUSTIFICATION :




PROPOSED LAND USE MAP - 2030

• ACCORDING TO THE PREVAILING LAND USE CLASSIFICATION, THE SELECTED SITE IS DESIGNATED FOR COMMERCIAL USE, INDICATING THAT IT IS LEGALLY APPROVED AND INTENDED FOR ACTIVITIES SUCH AS TRADE, BUSINESS, RETAIL, AND OTHER COMMERCIAL ENTERPRISES.

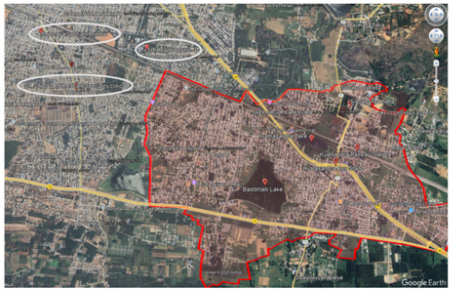
THE URDPFI GUIDELINES EXPLICITLY SUPPORT MIXED-LAND-USE IN URBAN AREAS—INCLUDING A BLEND OF HEALTHCARE, COMMERCIAL, AND WELLNESS AMENITIES. THEY ENCOURAGE INTEGRATING SOCIAL FACILITIES (HEALTHCARE) WITH SERVICE/COMMERCIAL USES (CAFETERIA, SHOPS) TO CREATE A HEALTHIER ENVIRONMENT .

### PRIMARY HEALTH CARE + MEDITATION & THERAPY CENTRE



KYATSANDRA, A GROWING LOCALITY IN TUMKUR WARD 34, LACKS ADEQUATE HEALTHCARE DESPITE ITS RAPID DEVELOPMENT AND PROXIMITY TO KEY INSTITUTIONS. RESIDENTS CURRENTLY TRAVEL 6–8 KM FOR BASIC MEDICAL SERVICES, CAUSING DELAYS IN EMERGENCIES AND INCREASING DEPENDENCE ON COSTLY PRIVATE CLINICS.

ESTABLISHING A PHC HERE WOULD ENSURE ACCESSIBLE, AFFORDABLE HEALTHCARE, REDUCE THE BURDEN ON CITY HOSPITALS, AND IMPROVE PUBLIC HEALTH OUTCOMES FOR LOCAL AND NEARBY RURAL COMMUNITIES.




HEALTH CARE FACILITIES NEAR TO THE PRESINCT

CURRENTLY, RESIDENTS ARE FORCED TO TRAVEL TO TUMKUR CITY, LOCATED APPROXIMATELY 6-8 KILOMETERS AWAY, TO ACCESS EVEN BASIC MEDICAL SERVICES.

CHINMAYA SPECIALIST CENTRE

SIT TUMKUR

DR.SHILPA'S MOTHER CARE SPECIALITY CLINIC

**SCOPE OF THE PROJECT:**

- THIS PROJECT AIMS TO ESTABLISH A PRIMARY HEALTHCARE CENTER IN KYATSANDRA, TUMKUR THAT INTEGRATES ESSENTIAL MEDICAL SERVICES, DIAGNOSTIC LABS, PREVENTIVE WELLNESS PROGRAMS, AND ALTERNATIVE THERAPIES UNDER ONE ROOF.
- THE PROPOSED CENTER WILL SERVE AS A REGIONAL HEALTHCARE NODE THAT ADDRESSES THE IMMEDIATE HEALTH NEEDS OF THE LOCAL POPULATION WHILE PROMOTING LONG-TERM WELLNESS

**STANDARDS : INDIAN PUBLIC HEALTH STANDARDS (IPHS) – 2022**

1. SITE & LOCATION STANDARDS

•PHC SHOULD BE CENTRALLY LOCATED IN HIGH-DENSITY AREAS.
•MUST BE ACCESSIBLE BY ROAD, NOT IN FLOOD-PRONE AREAS.
•ENSURE AVAILABILITY OF PUBLIC UTILITIES: ELECTRICITY, WATER, SEWAGE, STORM-WATER DISPOSAL.

2.ACCESSIBILITY STANDARDS

•MUST BE DISABLED AND ELDERLY FRIENDLY AS PER THE "BARRIER-FREE ENVIRONMENT GUIDELINES" OF GOVT. OF INDIA AND THE PERSONS WITH DISABILITY ACT, 2016.
•INCLUDE TACTILE PATHS, RAMPS (1:15 TO 1:18 SLOPE), ACCESSIBLE TOILETS, AND HANDRAILS.

3.CLINICAL SERVICE AREA DESIGN NORMS

•CONSULTATION ROOM: MINIMUM 12 SQ. M.
•LABORATORY: CLEARLY ZONED AREAS, ACID/ALKALI-PROOF COUNTERS.
•IMMUNIZATION ROOM: 3M X 4M WITH COLD STORAGE.
•LABOUR ROOM (IF APPLICABLE): MINIMUM 225 SQ. FT., PREFERABLY 350 SQ. FT.
•IPD BEDS:
- PHC: 2 ESSENTIAL + 4 DESIRABLE
- 24X7 PHC: 6 ESSENTIAL + 4 DESIRABLE

5.BUILDING CODE COMPLIANCE

•MUST FOLLOW STATE BUILDING BY-LAWS AND NATIONAL BUILDING CODE (NBC) STANDARDS.
•BUILDINGS MUST BE CLIMATE, DISASTER, AND ENVIRONMENT-RESILIENT.

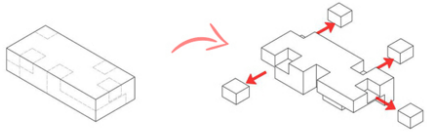
6.WASTE & SANITATION

•BIOMEDICAL WASTE MANAGEMENT MUST FOLLOW BMWM RULES 2016.
•SEPARATE SYSTEMS FOR LIQUID, GENERAL, BIOMEDICAL, AND HAZARDOUS WASTE.
•PROVISION FOR ETP (EFFLUENT TREATMENT PLANT) WHERE NEEDED.

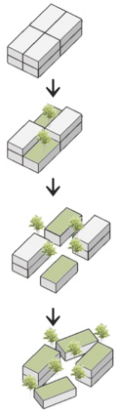
7.SUPPORT INFRASTRUCTURE

•PARKING FOR STAFF, AMBULANCES, PATIENTS
•GREEN ZONES AND HERBAL GARDENS ENCOURAGED
•ADEQUATE STORE ROOMS, RECORD STORAGE, AND ELECTRICAL ROOM PER SAFETY NORMS.

### CONCEPT:



THE TRANSFORMATION OF A SOLID MASS INTO A DYNAMIC SPATIAL ARRANGEMENT



**ADDITIVE FORM** INVOLVES CREATING ARCHITECTURE BY COMBINING OR ASSEMBLING SMALLER VOLUMES, SYMBOLIZING GROWTH AND PROGRESSION.
**SUBTRACTIVE FORM** IS ABOUT CARVING OUT SPACE FROM A SOLID MASS, REPRESENTING INTROSPECTION, HEALING, AND MINIMALISM.

### ZONING :


SITE PLAN

## AREA PROGRAM

**1. Site Details**

| Item | Value |
|---|---|
| Total Site Area | 11,011 m² |
| Max Ground Coverage (50%) | 5,505.5 m² |
| FAR (Permitted) | 2.0 |
| Max Built-Up (FAR x Site Area) | 22,022 m² |
| Actual Built-Up (Total) | 3,116.99 m² |

**2. Built-Up Area (Block-Wise)**

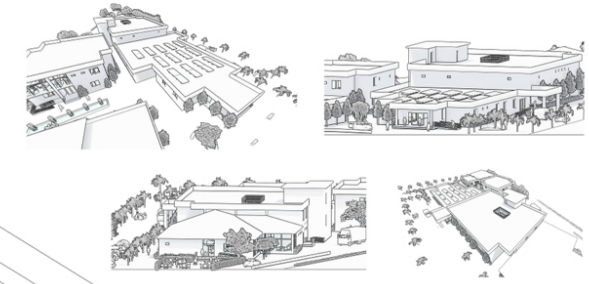
| Block | Floors | Built-Up Area (m²) |
|---|---|---|
| Primary Health Centre (G+1) | G+1 | 1730.66 |
| Cafeteria (G) | G | 545.2 |
| Meditation Centre (G) | G | 470.18 |
| Therapy Centre (G+1) | G+1 | 370.98 |
| Total Built-Up | - | 3116.99 |

**3. Open Spaces**

| Component | Area (m²) |
|---|---|
| Recreational Garden | 645.99 |
| Therapy Garden | 75.33 |
| Parking Area | 645.04 |
| Pathways + Landscape + Roads | 6527.65 |
| Total Open Spaces | 7893.01 |

**4. Site Utilization Summary**

| Category | Area (m²) | % of Site |
|---|---|---|
| Built-Up Area (all blocks) | 3116.99 | 28.3 |
| Open Space: Gardens | 721.32 | 6.55 |
| Parking Area | 645.04 | 5.86 |
| Pathways + Landscape + Roads | 6527.65 | 59.29 |
| Total | 11011.0 | 100.0 |



CONCEPTUAL VIEWS

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BIPIN ACHAPPA N M 1AA21AT012 8TH SEM AD 8 ANRVSA

# SITE PLAN

PRIMARY HEALTH CARE & THERAPY CENTRE


SITE PLAN

SCALE 1:500

KEY MAP

LEGEND:

| | |
|---|---|
| 1. PRIMARY HEALTH CENTRE | - 1730.66 M² |
| 2. CAFETERIA | - 545.20 M² |
| 3. MEDITATION CENTRE | - 470.18 M² |
| 4. THERAPY CENTRE | - 370.98 M² |
| 5. COURTYARD DINING | - 251.90 M² |
| 6. PARKING LOT | - 675.04 M² |
| 7. THERAPY GARDEN | - 75.60 M² |
| 8. RECREATIONAL GARDEN | - 645.90 M² |



SIDE ELEVATION - WEST


FRONT ELEVATION - NORTH

SIDE ELEVATION - EAST

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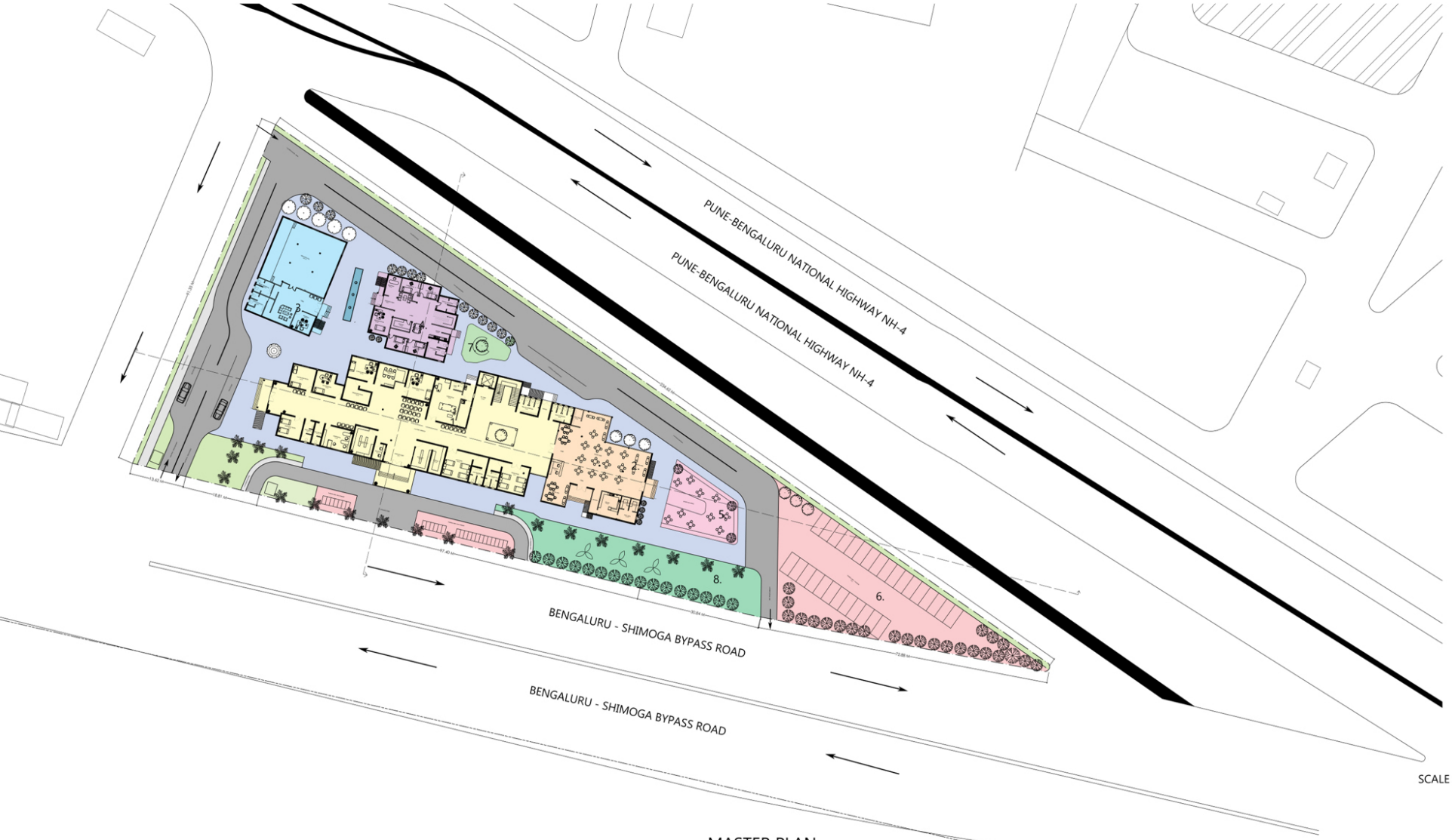
# MASTER PLAN

PRIMARY HEALTH CARE & THERAPY CENTRE




KEY MAP

LEGEND:

- PRIMARY HEALTH CENTRE
- CAFETERIA
- MEDITATION CENTRE
- THERAPY CENTRE
- COURTYARD DINING
- PARKING LOT
- THERAPY GARDEN
- RECREATIONAL GARDEN
- LANDSCAPE
- ROAD
- PEDESTRAIN

SCALE 1:500

MASTER PLAN

SECTION @ A-A'

SECTION @ B-B'

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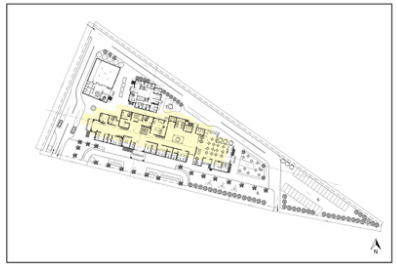
# FLOOR PLANS

PRIMARY HEALTH CARE & CAFETERIA


FIRST FLOOR PLAN



KEY MAP

LEGEND:

- CIRCULATION SPACE
- CORE AREA
- WASHROOM
- KITCHEN
- DINING AREA
- ROOF
- PRIVATE
- SEMI PRIVATE
- TERRACE


GROUND FLOOR PLAN

SCALE 1:150

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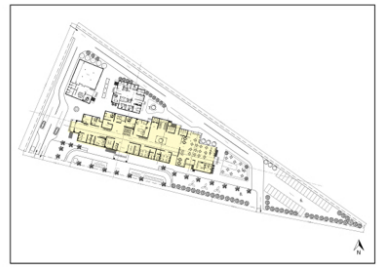
# PHC & CAFETERIA

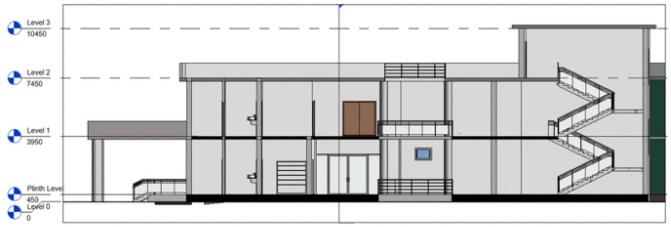
ELEVATION, SECTION & VIEWS



KEY MAP


FRONT ELEVATION


SIDE ELEVATION




SECTION @ Y - Y'


SECTION @ X - X'


SECTION @ X -X'

RENDERED VIEWS

N

# THERAPY CENTRE

PLANS, ELEVATION, SECTION & VIEWS

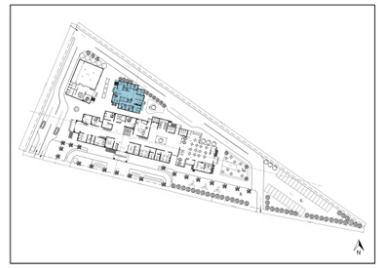
LEGEND:

- CIRCULATION SPACE
- CORE AREA
- WASHROOM
- KITCHEN
- GYM
- SERVICES


FIRST FLOOR PLAN


GROUND FLOOR PLAN SCALE 1:100

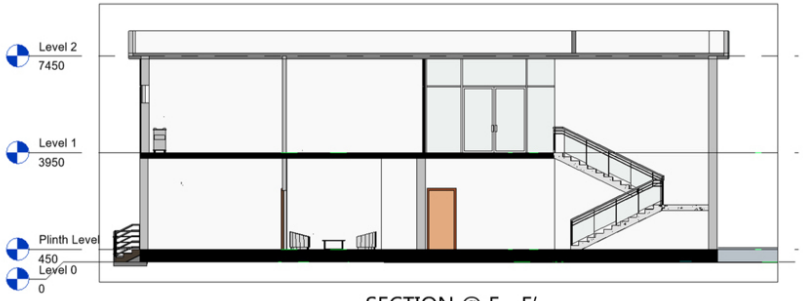

FRONT ELEVATION



KEY MAP


REAR ELEVATION


SECTION @ F - F'



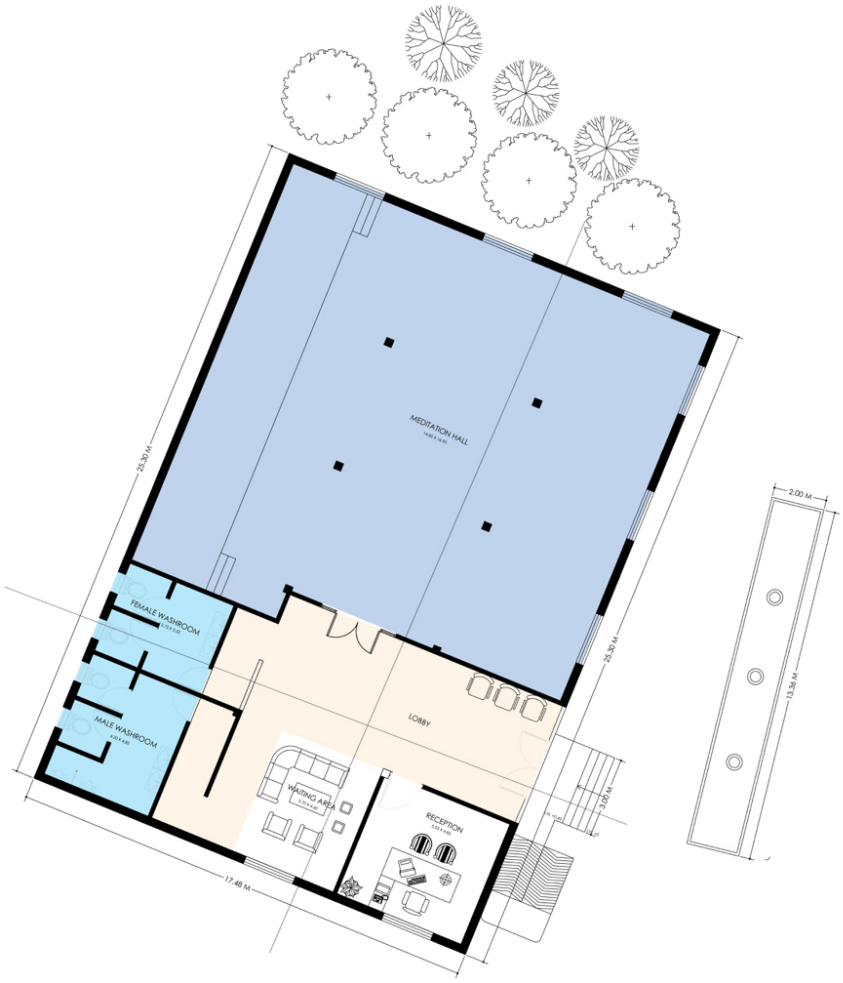

SECTION @ E - E'

RENDERED VIEWS

N

# MEDITATION HALL

PLAN, ELEVATION, SECTION AND VIEWS




LEGEND:

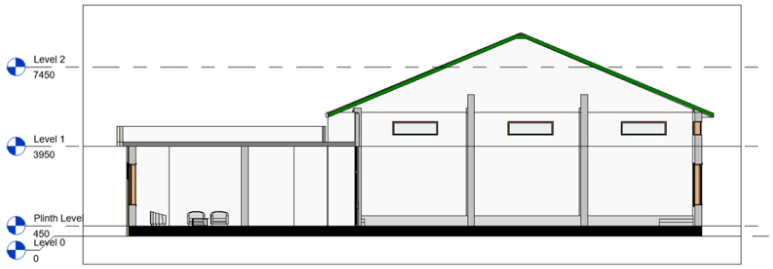
CIRCULATION SPACE

WASHROOM

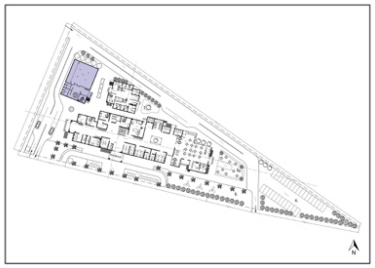
GYM

GROUND FLOOR PLAN

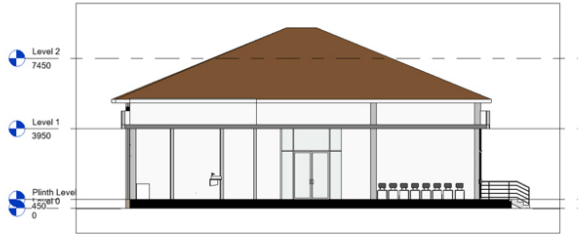
SCALE 1:100




SECTION @ C-C'



KEY MAP




SECTION @ D - D'


REAR ELEVATION


FRONT ELEVATION

RENDERED VIEWS

N

# INDIVIDUAL PROJECT

RENDERED VIEWS