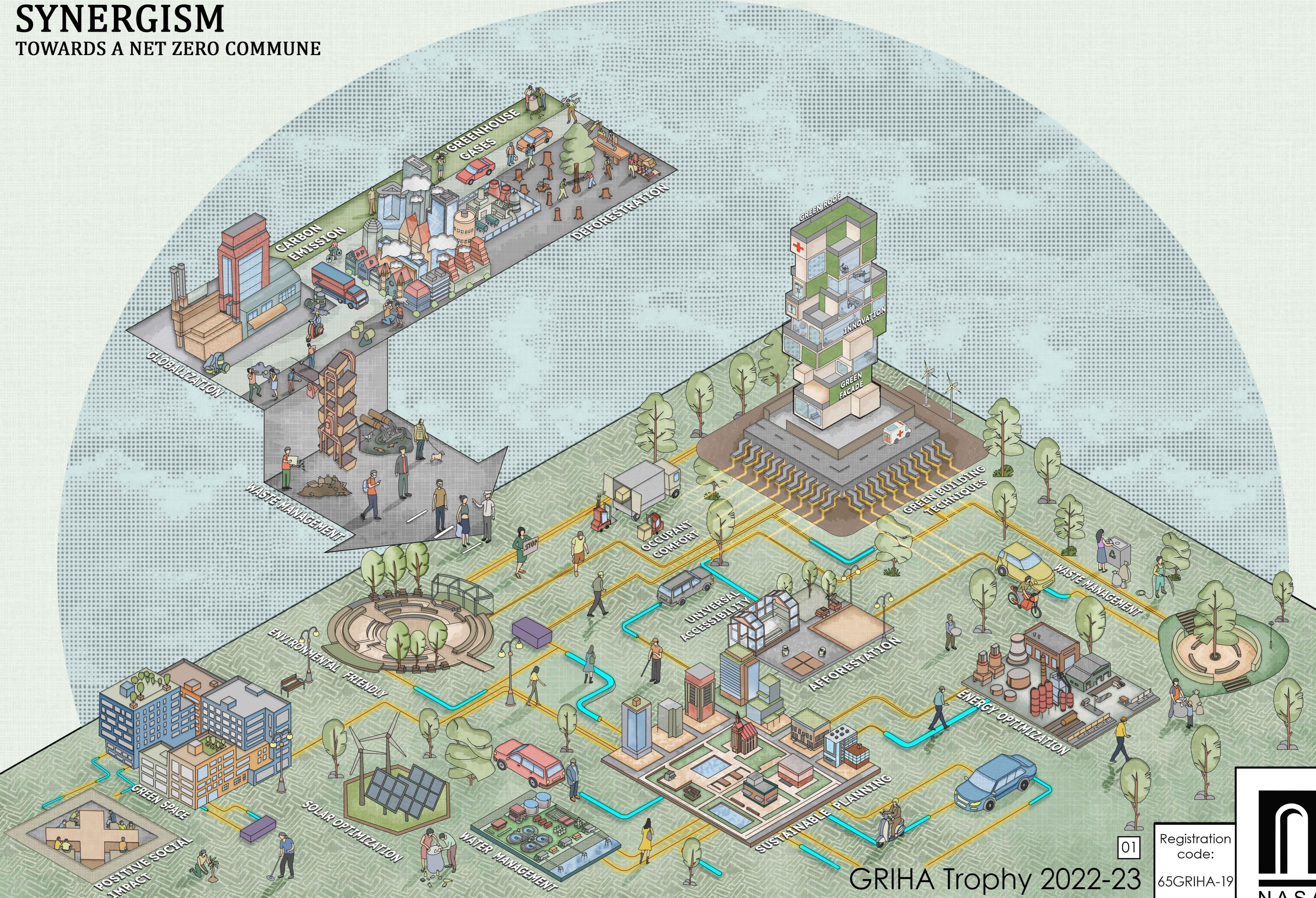


SYNERGISM

TOWARDS A NET ZERO COMMUNE

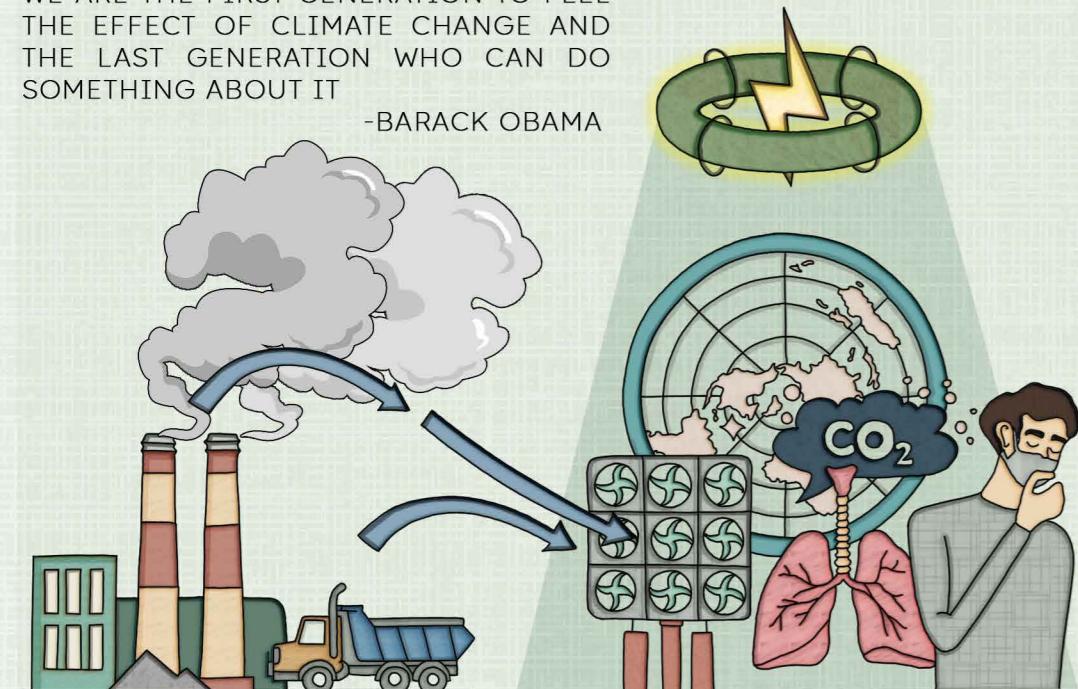


ENVIRONMENTAL ISSUE

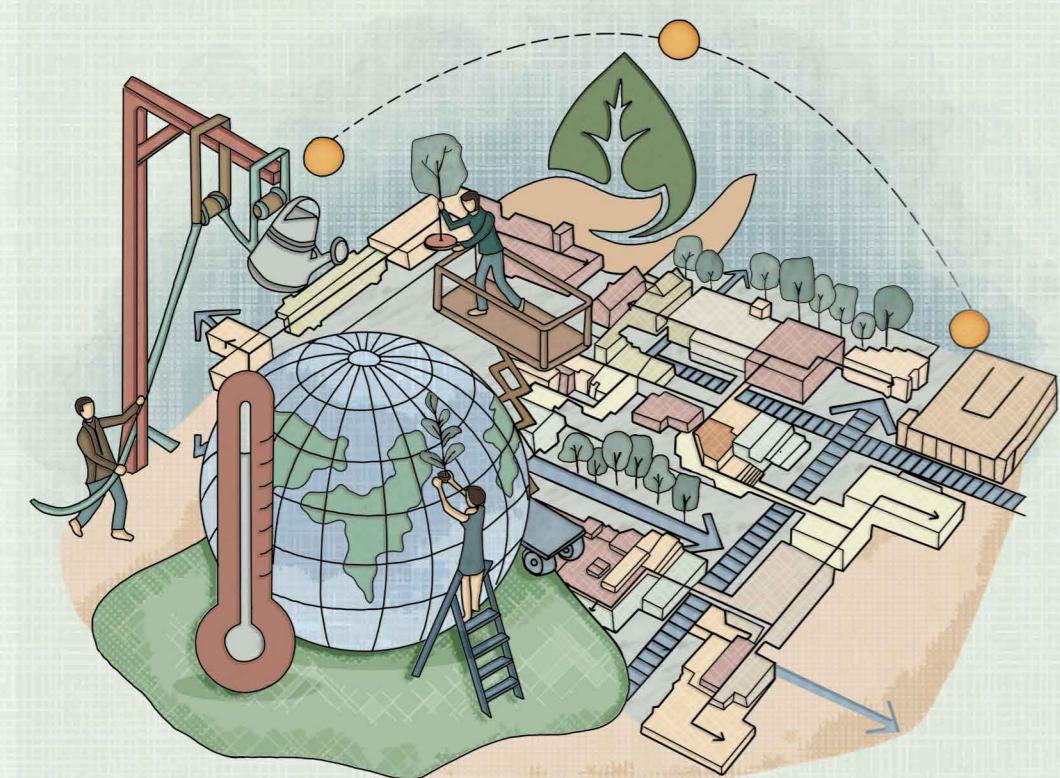
CLIMATE CHANGE MITIGATION AND ADAPTION

WE ARE THE FIRST GENERATION TO FEEL THE EFFECT OF CLIMATE CHANGE AND THE LAST GENERATION WHO CAN DO SOMETHING ABOUT IT

-BARACK OBAMA



SUSTAINABLE URBAN DEVELOPMENT AND MOBILITY



SUSTAINABLE URBAN DEVELOPMENT IS A WHOLESOME APPROACH THAT CEASES THE CITIES FROM DISINTEGRATING. IT ENCOURAGES **INCLUSIVE DEVELOPMENT**, AN ESSENTIAL FOUNDATION FOR SUSTAINABILITY, EQUITY, SHARED PROSPERITY, AND CIVIL SOCIETY.

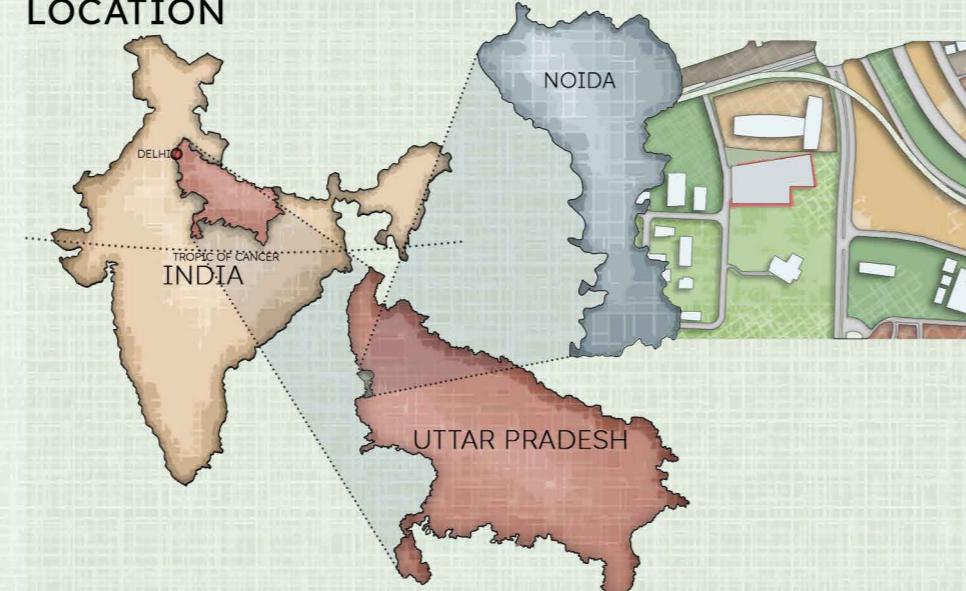
NEED FOR GREEN BUILDING



MODERN TIMES COMPRIZE EDIFICES THAT EMIT HARMFUL POLLUTANTS LEADING TO THE **DEPLETION** OF ENVIRONMENTAL RESOURCES. HENCEFORTH, IT IS AN OBLIGATION TO ENDORSE NET GREEN HABITAT.

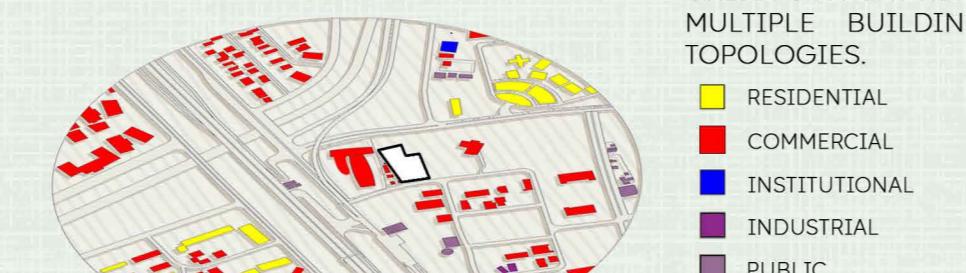
SITE INTRODUCTION

LOCATION



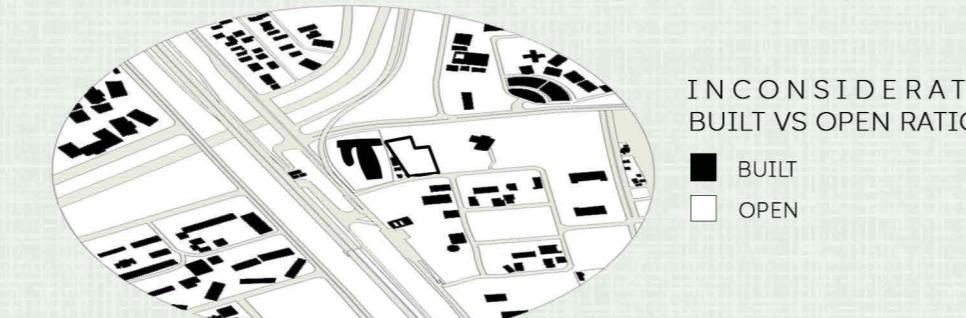
NOIDA IS A CONTRIVED CITY, LOCATED IN UTTAR PRADESH, INDIA, AMIDST A THRIVING INDUSTRIALIZED CONTEXT.

SITE ANALYSIS



URBAN CONTEXT WITH MULTIPLE BUILDING TOPOLOGIES.

- RESIDENTIAL
- COMMERCIAL
- INSTITUTIONAL
- INDUSTRIAL
- PUBLIC



IN CONSIDERATE BUILT VS OPEN RATIO.

- BUILT
- OPEN



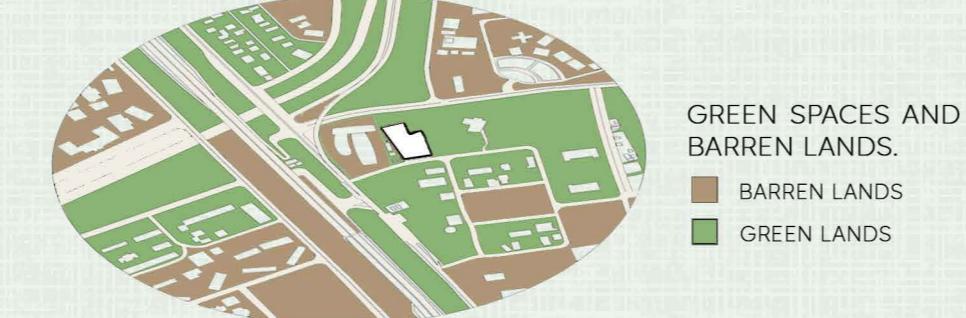
CATEGORISED BUILDING HEIGHTS.

- LOW RISE
- HIGH RISE



ROAD NETWORK EXIBITING THE CIRCULATION.

- METRO
- PRIMARY ROADS
- SECONDARY ROADS
- TERTIARY ROADS

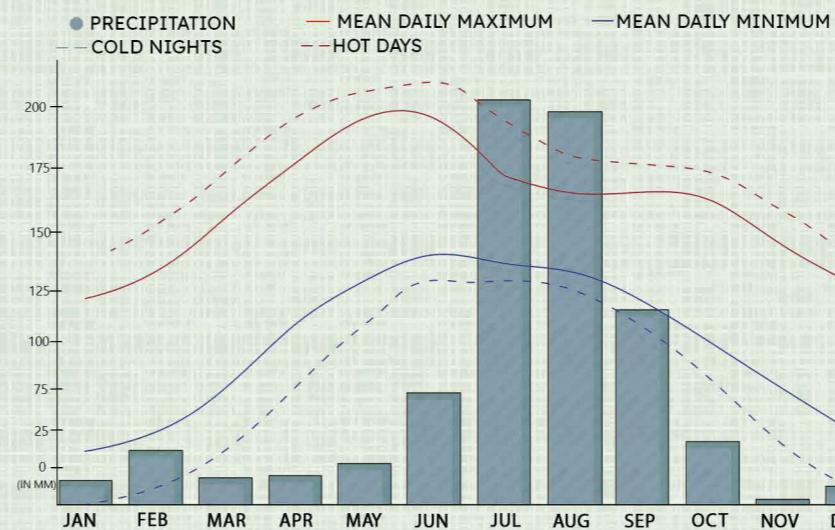


GREEN SPACES AND BARREN LANDS.

- BARREN LANDS
- GREEN LANDS

CLIMATE OF NOIDA

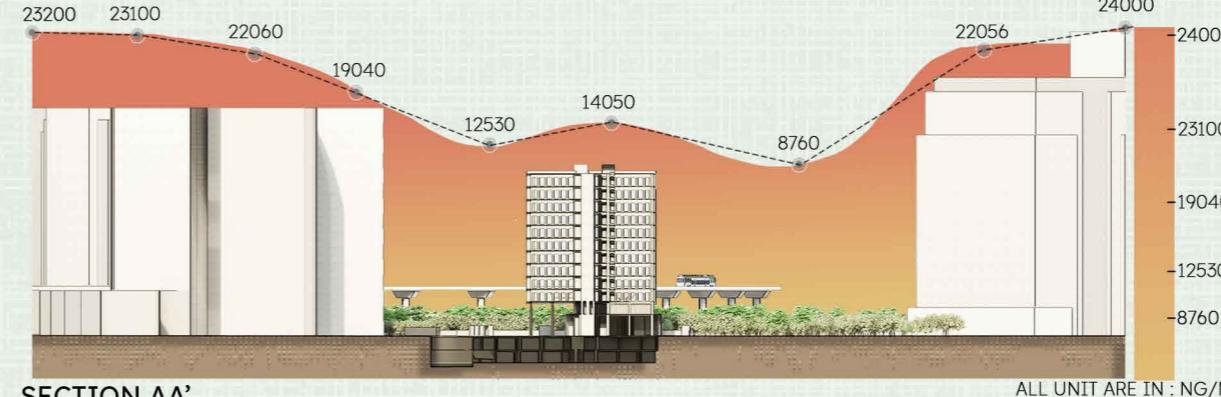
TEMPERATURE AND PRECIPITATION



NOIDA FALLS WITHIN THE HUMID SUBTROPICAL REGION WITH MODERATE PRECIPITATION.

EXISTING SITE

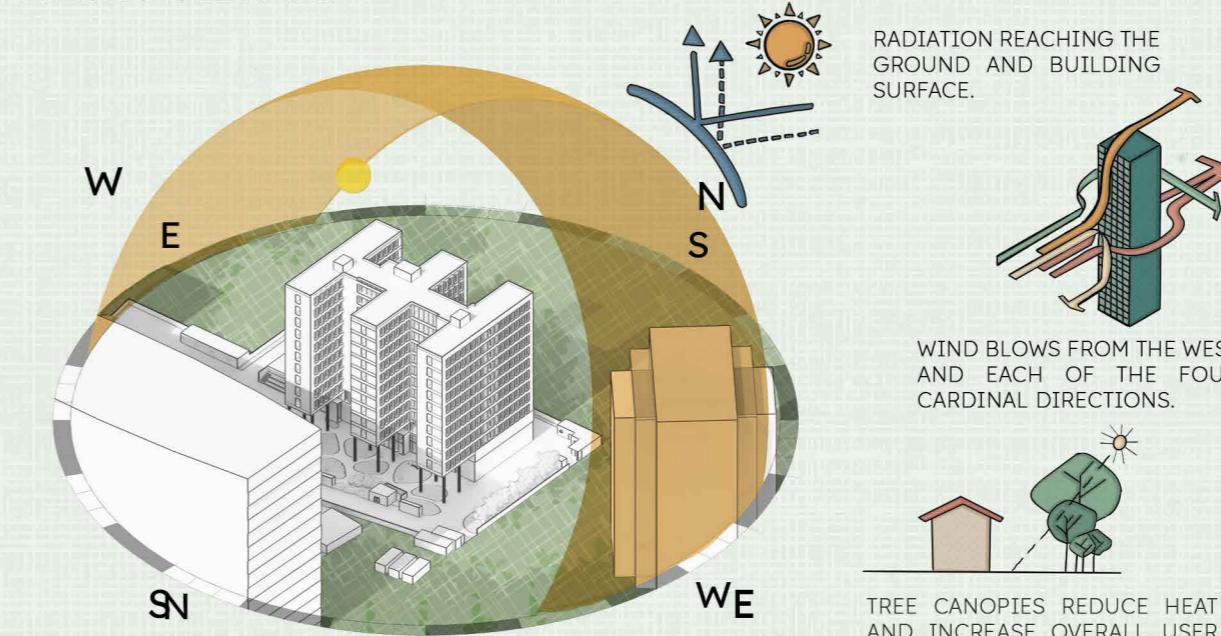
URBAN HEAT ISLAND EFFECT



SITE PLAN



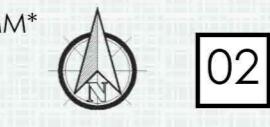
MACRO CLIMATE



THE SITE IS LOCATED ON FLAT LAND WITH DENSE VEGETATION IN ITS SURROUNDING AREAS, AS WELL AS AN EXISTING STRUCTURE THAT REDUCES SOLAR HEAT RADIATION.

INFERRENCES AND CATEGORIES ARE ILLUSTRATED BY FORMER SITE OBSERVATIONS.

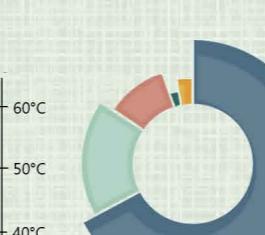
ALL DIMENSIONS ARE IN MM*



Registration code:

65GRIHA-19

AIR QUALITY INDEX



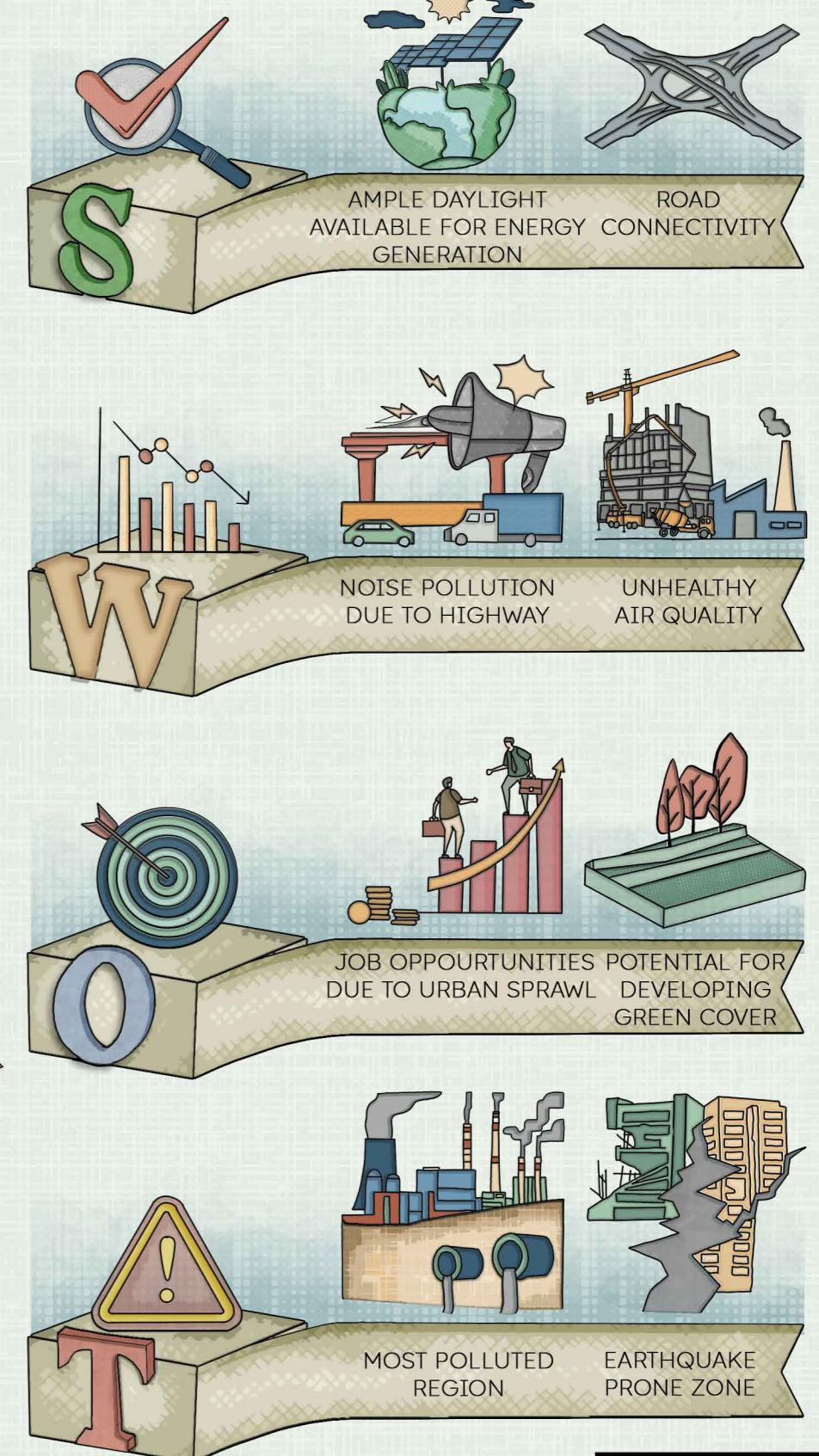
AIR POLLUTANTS

PM10	70.4 ug/m ³
PM2.5	1571 ug/m ³
O ₃	64.8 ug/m ³
NO ₂	58.8 ug/m ³
SO ₂	9.60 ug/m ³

0-25 25-50 50-75 75-100 100-125 125-150 150-175 175-200 200-300 300-400 >400

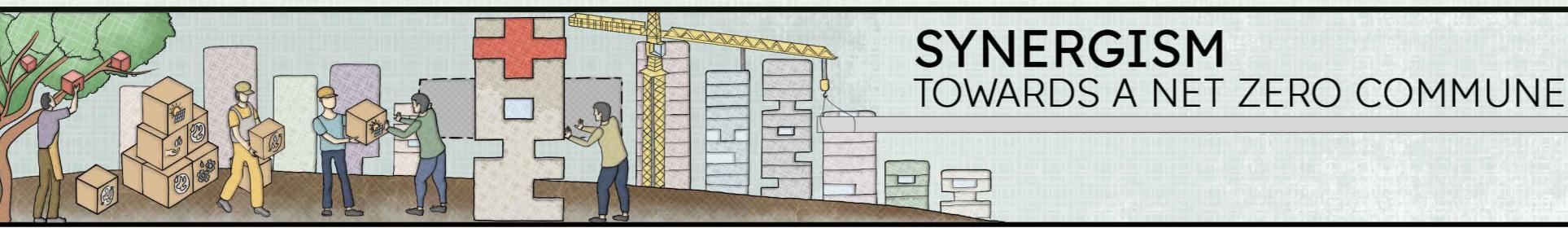
AIR QUALITY INDEX SHOWCASING THE CONCENTRATION OF POLLUTANTS IN VICINITY OF SITE AND THE CITY OF NOIDA.

SWOT ANALYSIS



SYNERGISM

TOWARDS A NET ZERO COMMUNE



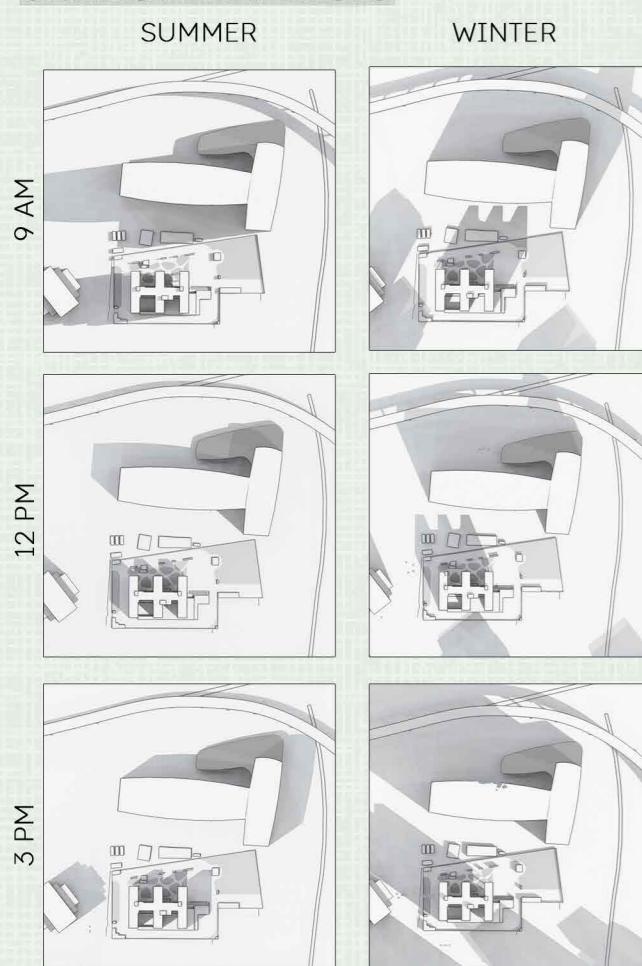
GRIHA Trophy 2022-23

EXISTING BUILDING ANALYSIS

AREA STATEMENT

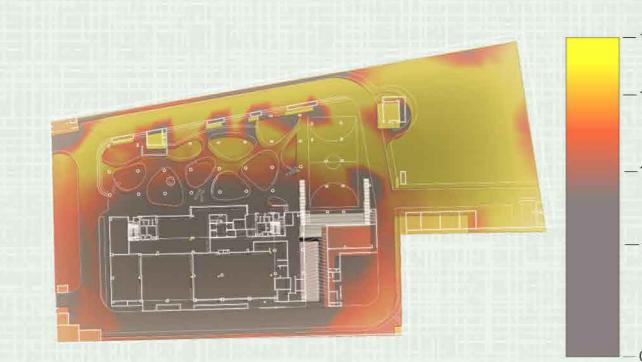
SPACE	AREA (IN SQ. METER)
TOTAL PLOT AREA	11,000
BUILT-UP AREA	36,090
GROUND FLOOR AREA	2,000
SERVICES	1,820.6
BUILT VS OPEN RATIO	18 : 82
PARKING	11,800

SHADOW ANALYSIS

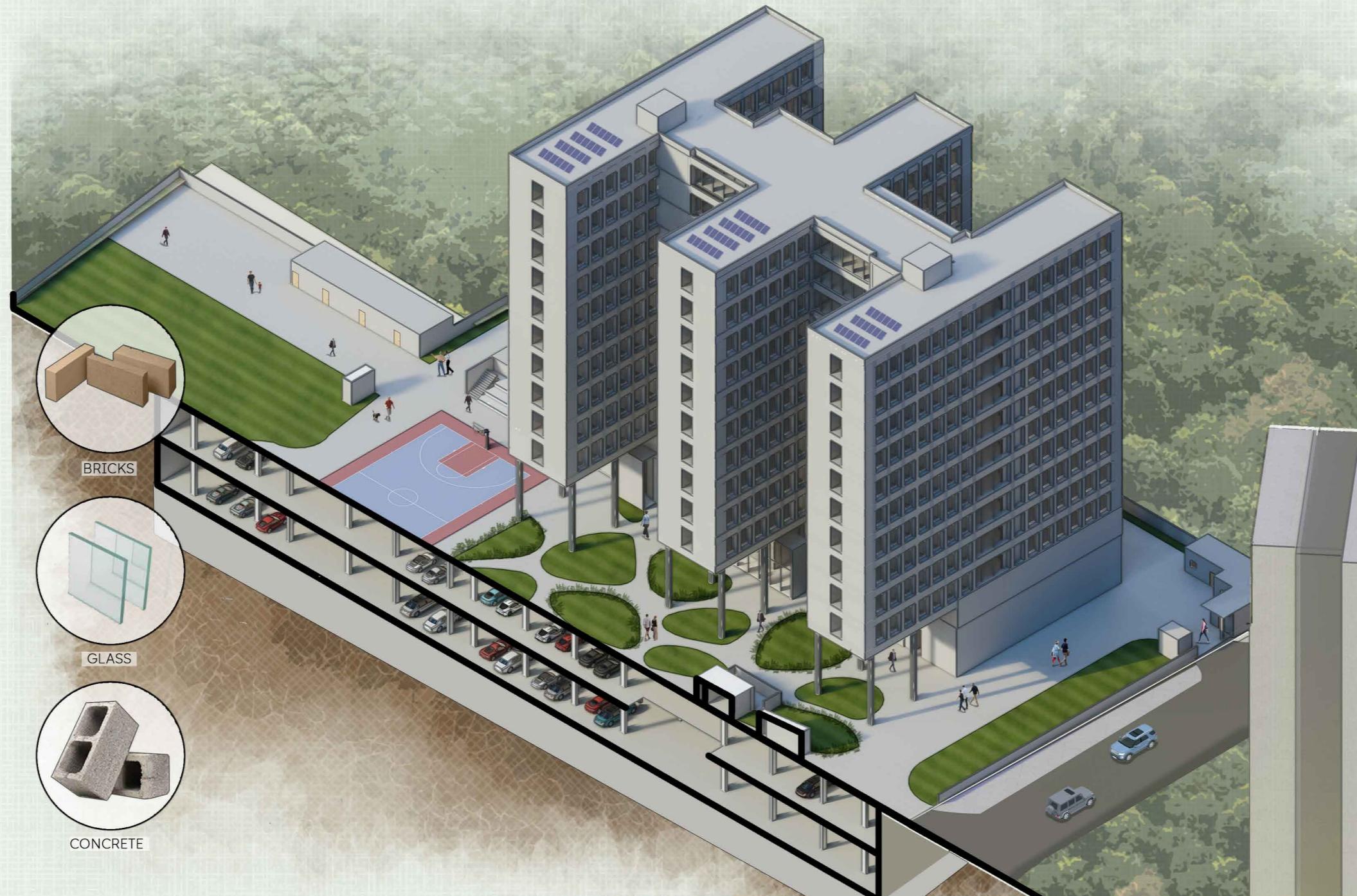


THE COURTYARDS REMAINED SHADED FROM DUSK TILL DAWN.

DAYLIGHT FACTOR



THE EXISTING DESIGN ELEMENTS KEEPS THE FUNCTIONAL SPACES SHADED ALL-DAY LONG.



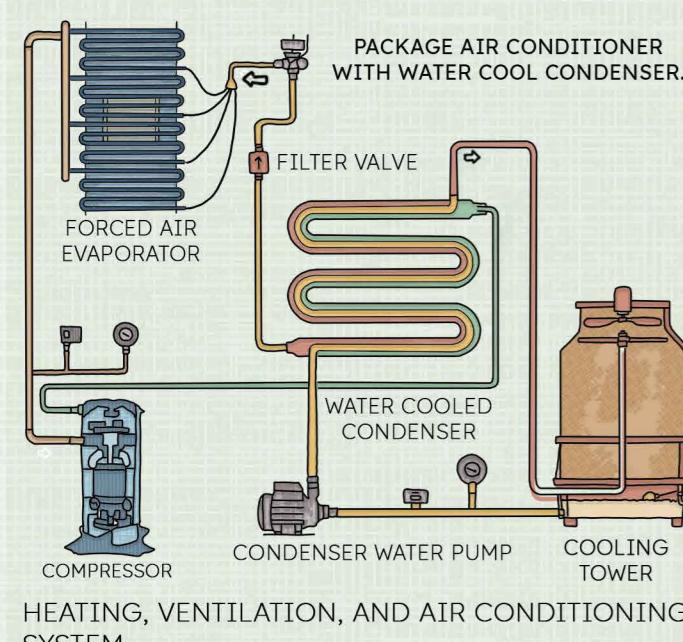
SOLAR GAIN ANALYSIS



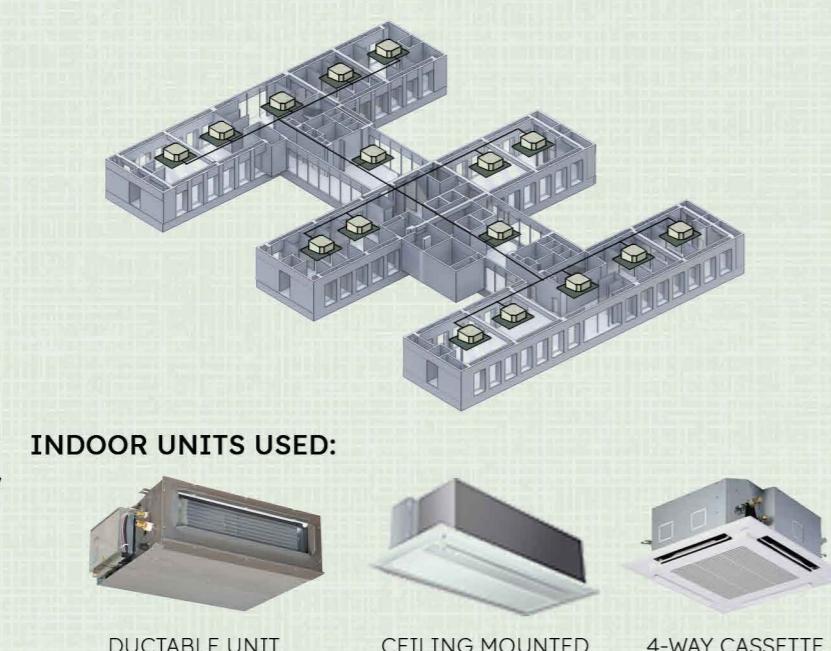
BUILDING IS A FRAME STRUCTURE WITH TWO-WAY SLAB SYSTEM.

EXISTING STRATEGIES

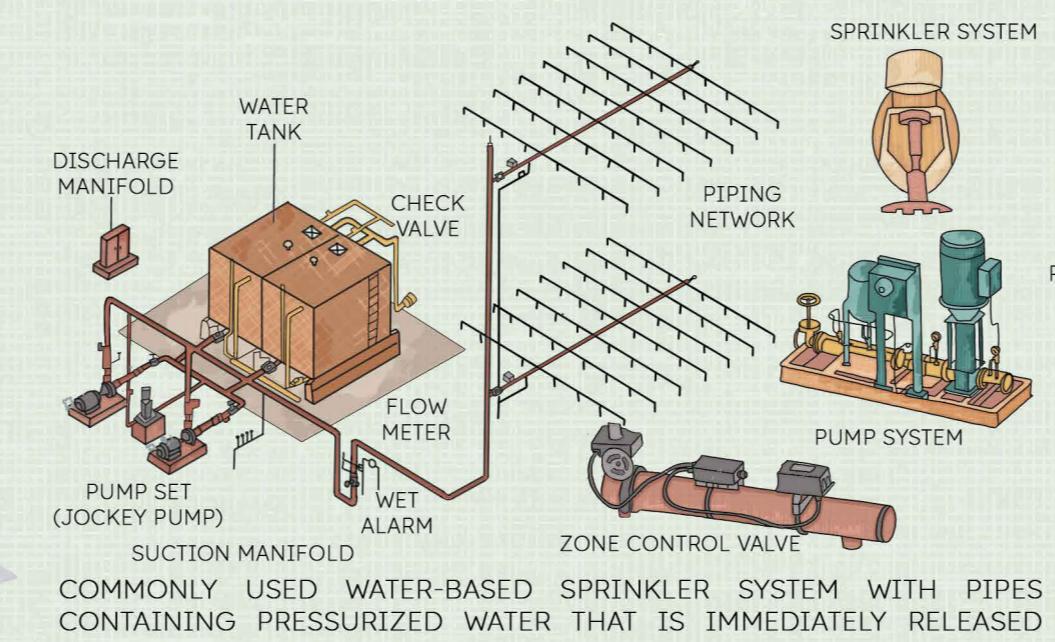
HVAC SYSTEM



HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM.



FIRE SUPPRESSION SYSTEM



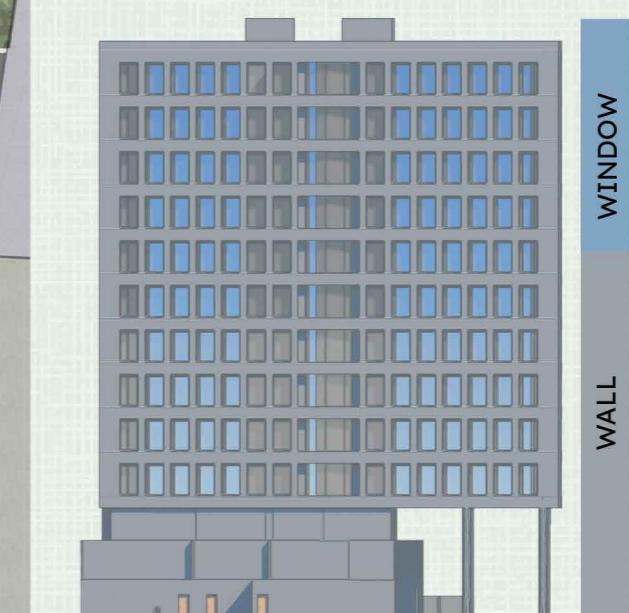
COMMONLY USED WATER-BASED SPRINKLER SYSTEM WITH PIPES CONTAINING PRESSURIZED WATER THAT IS IMMEDIATELY RELEASED FROM THE SPRINKLER HEADS WHEN A FIRE HAPPENS.

CFD SIMULATION



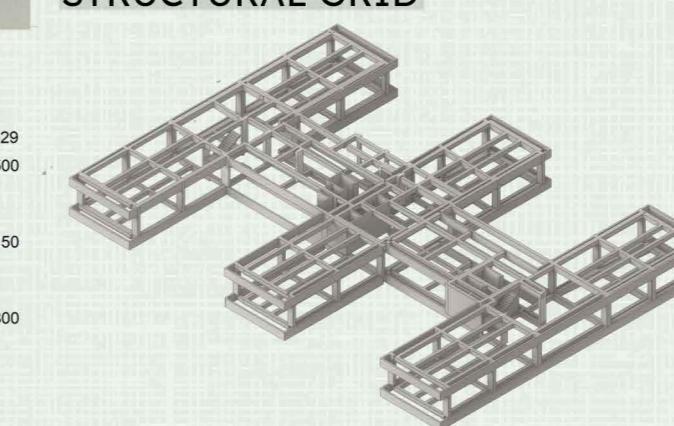
COMPUTATION FLUID DYNAMICS (CFD) IS AN ENGINEERING TOOL USED TO SIMULATE THE ACTION OF THERMO-FLUIDS IN A SYSTEM.

WALL-WINDOW RATIO



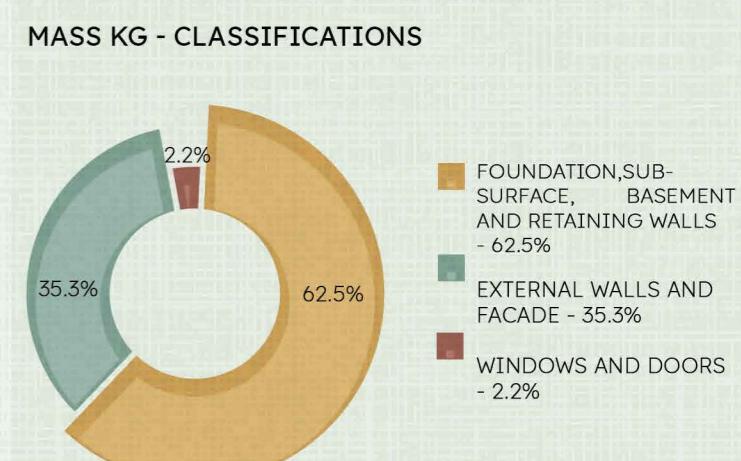
ANNUAL COOLING ENERGY DEMAND IS HIGHER THAN THE ANNUAL HEATING ENERGY DEMAND.

STRUCTURAL GRID



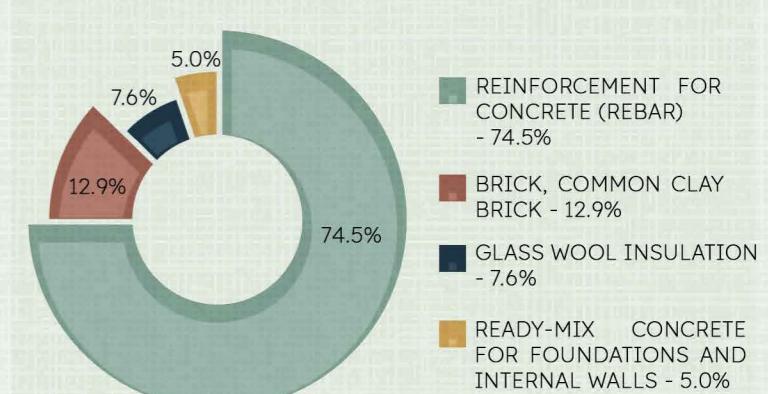
LIFE CYCLE ANALYSIS

MASS KG - CLASSIFICATIONS



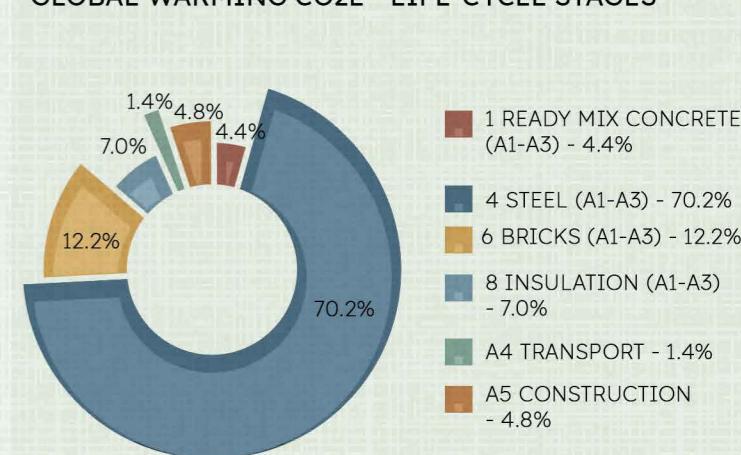
THE FOUNDATION, SUBSURFACE, BASEMENT, AND RETAINING WALLS CONTAIN THE BULK OF THE STRUCTURE'S MASS.

GLOBAL WARMING CO₂E - RESOURCE TYPES



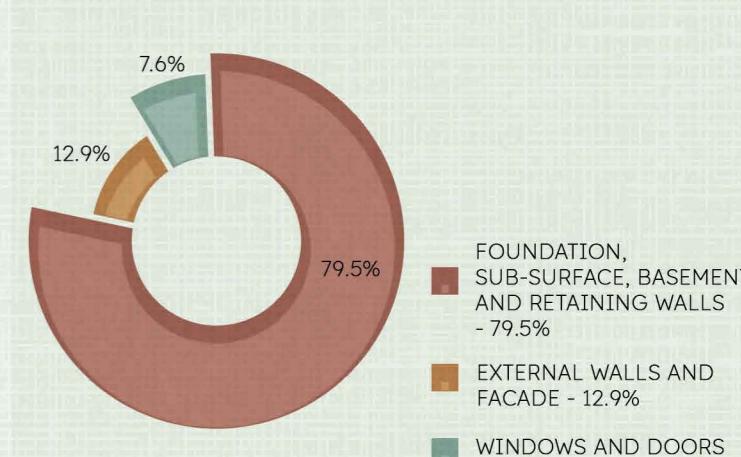
CONCRETE REINFORCEMENT IS THE MOST ENVIRONMENTALLY HARMFUL MATERIAL.

GLOBAL WARMING CO₂E - LIFE-CYCLE STAGES

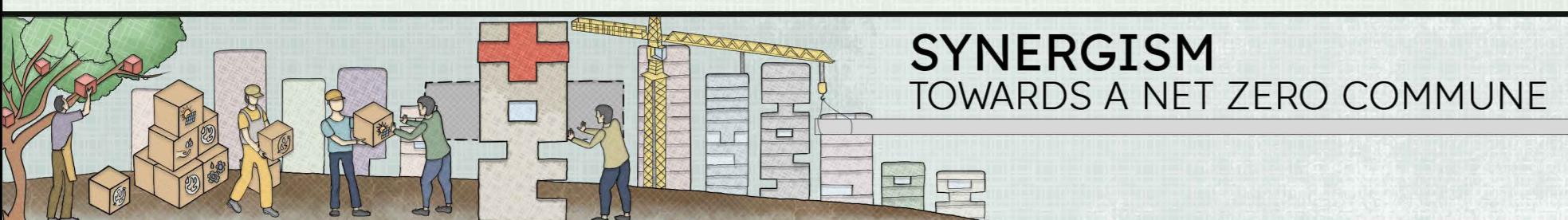


OVER TIME, STEEL CAUSES THE MOST DAMAGE TO THE ENVIRONMENT.

GLOBAL WARMING T CO₂E - CLASSIFICATIONS



A MAJORITY OF HARMFUL EFFLUENTS ARE RELEASED FROM FOUNDATIONS, SUBSURFACES, BASEMENTS, AND RETAINING WALLS.



SYNERGISM
TOWARDS A NET ZERO COMMUNE

ALL DIMENSIONS ARE IN MM*



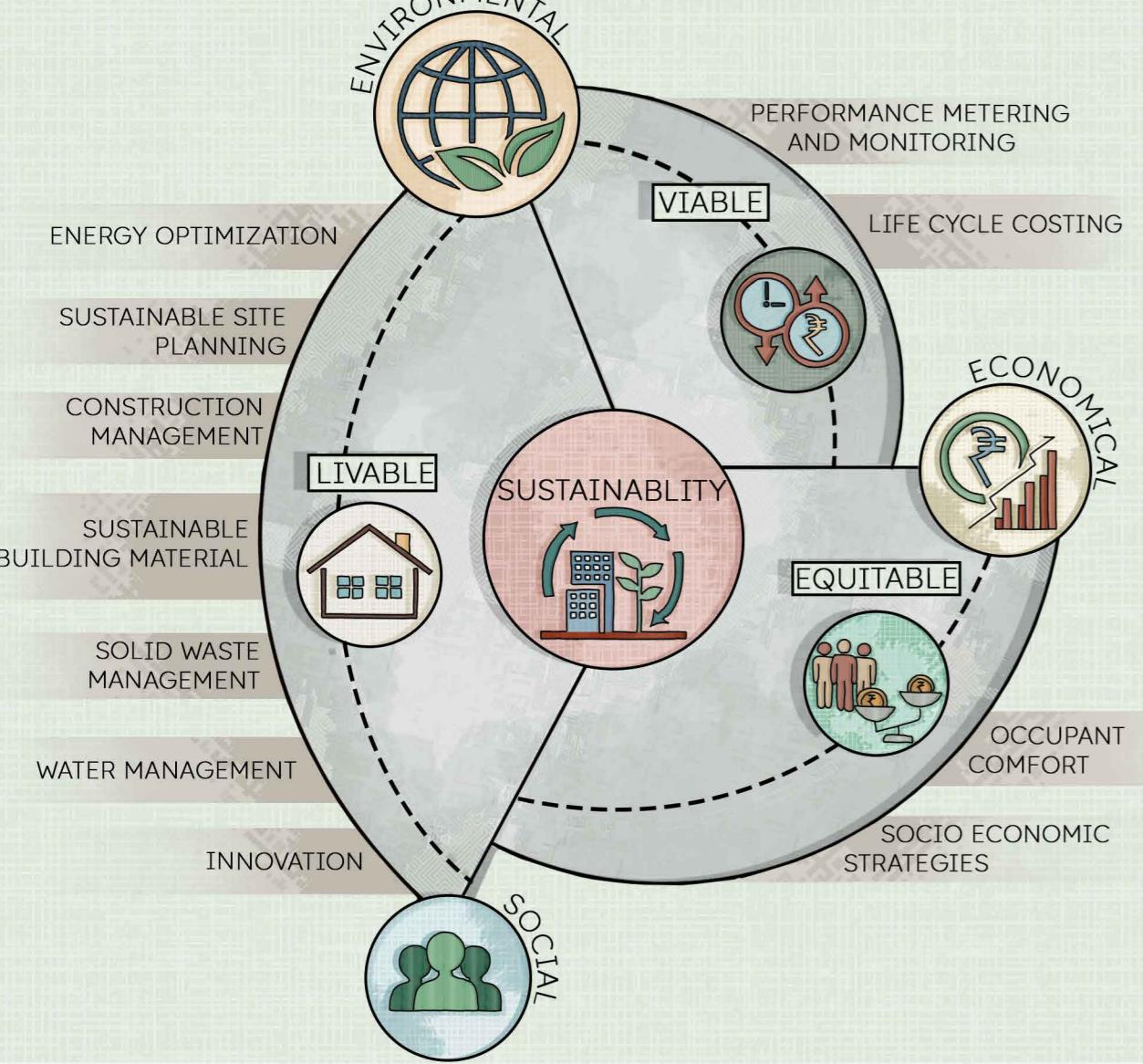
Registration
code:

65GRIHA-19



GRIHA Trophy 2022-23

DESIGN CONSIDERATION



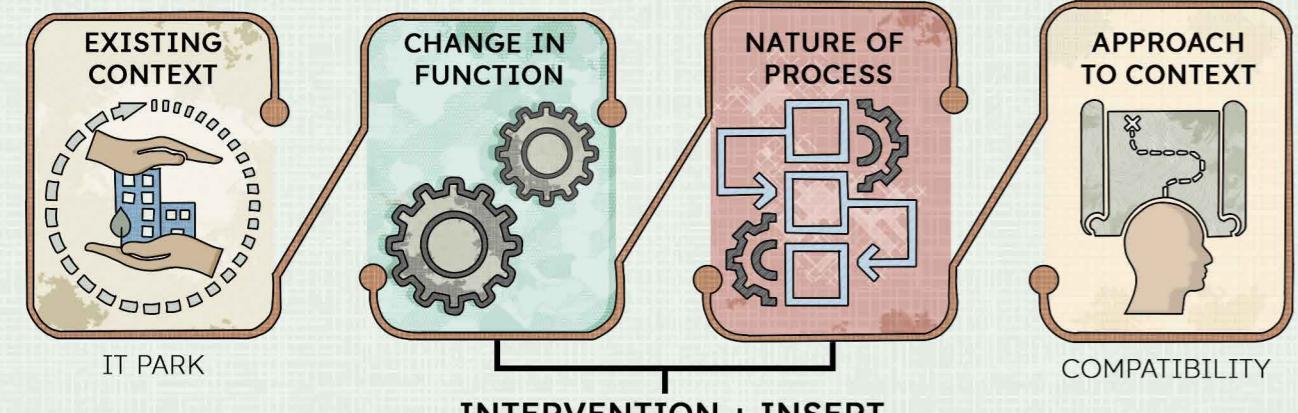
DESIGN PROGRAMME

SPACES	QUANTITY	AREA PER UNIT (M ²)	FOOTFALL	TOTAL AREA (M ²)
RECEPTION/ADMIN	1	60	30	60
PASSAGE	1	150	-	150
RECEIVING AREA	1	35	10	35
KITCHEN STORAGE	1	45	6	45
MEDICINAL STORAGE	1	50	5	50
SECURITY CABIN	1	10	2	10
DISH WASH	1	15	3	15
KITCHEN	1	35	10	35
DINING	1	360	180	360
PHARMACY	2	30	4	60
FINANCE	1	50	5	50
WASHROOM	10	45	-	450
MISCELLANEOUS	1	270	15	270
SERVICE CORE	2	770	-	1540
CAFE	1	360	100	360
RESEARCH SERVICES				
LABORATORY	1	130	20	130
BLOOD BANK	1	40	6	40
WAITING AREA	1	120	80	120
PASSAGE	1	150	-	150
IPD				
SIMPLE WARDS	66	12	80	792
TWIN ROOM	36	25	160	900
SINGLE ROOM	23	18	80	414

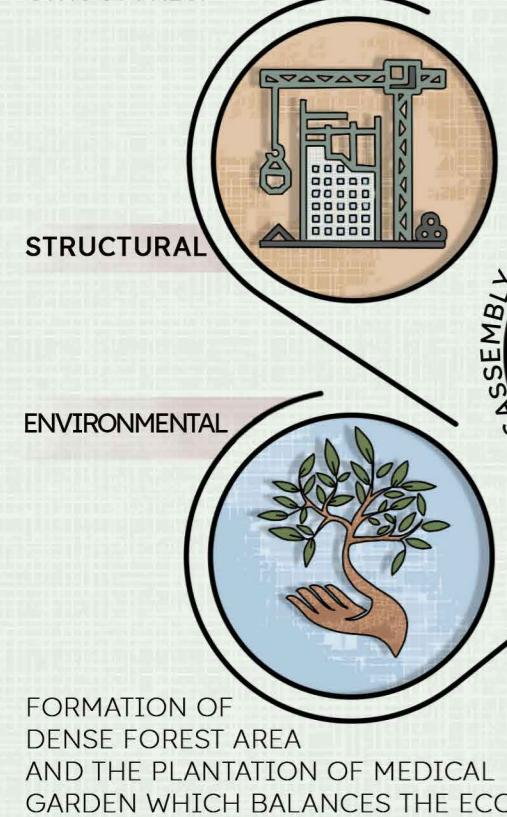
SPACES	QUANTITY	AREA PER UNIT (M ²)	FOOTFALL	TOTAL AREA (M ²)
ICU	30	20	60	600
NICU	1	150	15	150
GYNECOLOGY UNIT	1	170	15	170
OPD	24	23	75	552
DIAGNOSTIC SERVICES				
EMERGENCY DEPARTMENT	1	253	75	253
OPERATION THEATRE	4	48	25	192
PRE-POST UNITS	4	31	-	124
STERILE PROCESSING DEPARTMENT	4	25	-	100
SURGICAL SERVICES	1	30	10	30
CT	1	45	4	45
MRI	1	45	4	45
ULTRA SOUND ROOM	1	18	4	18
X - RAY ROOM	1	27	4	27
MORGUE ROOM	1	30	10	30
AUTOPSY ROOM	1	20	5	20
SECURITY ROOM	1	20	5	20
PARKING				
AMBULANCE	4	30	-	120
VISITORS PARKING	200	25	-	5000
STAFF PARKING	250	25	-	6250
TOTAL	686	3825	1107	19,287



REDESIGN TO RECIPROCAT

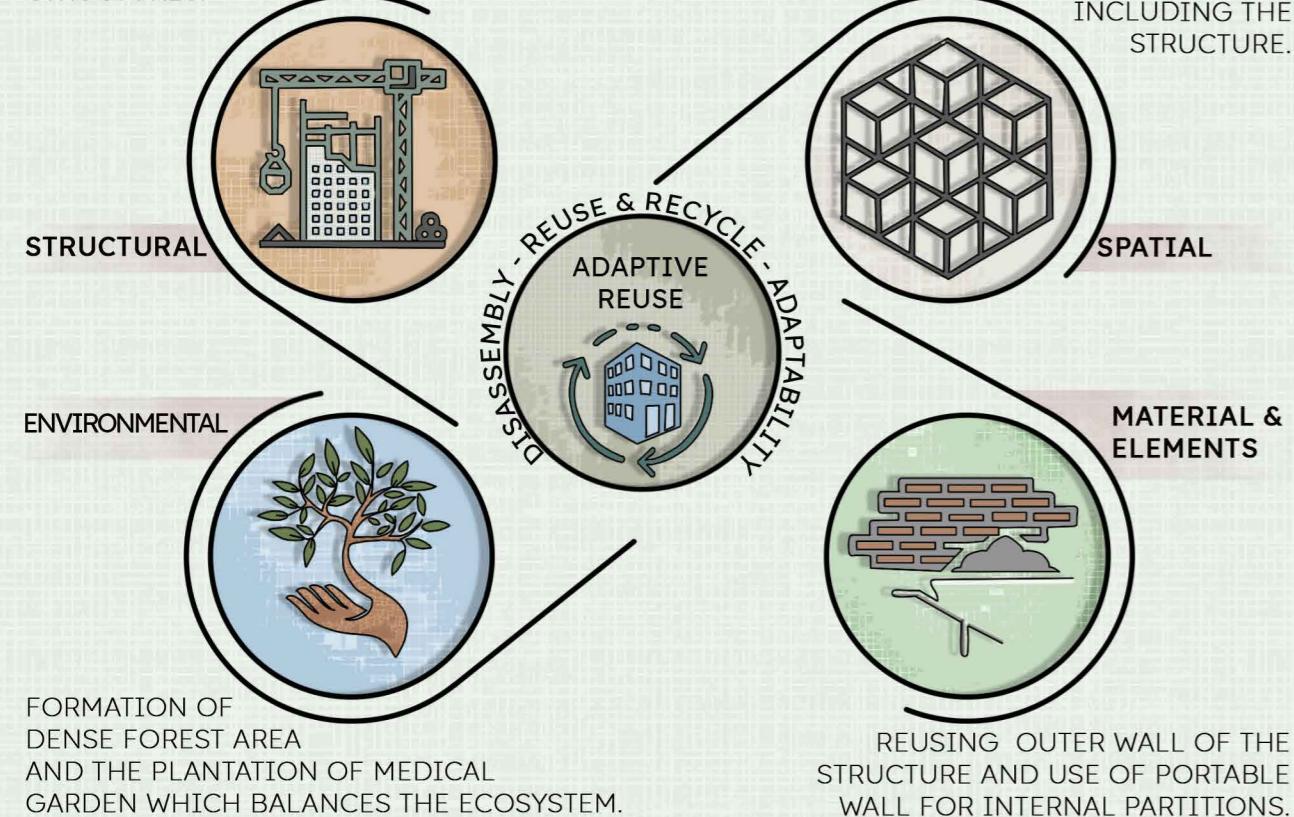


NATURE CAN BE PRESERVED THROUGH ADAPTIVE REUSE OF STRUCTURES.

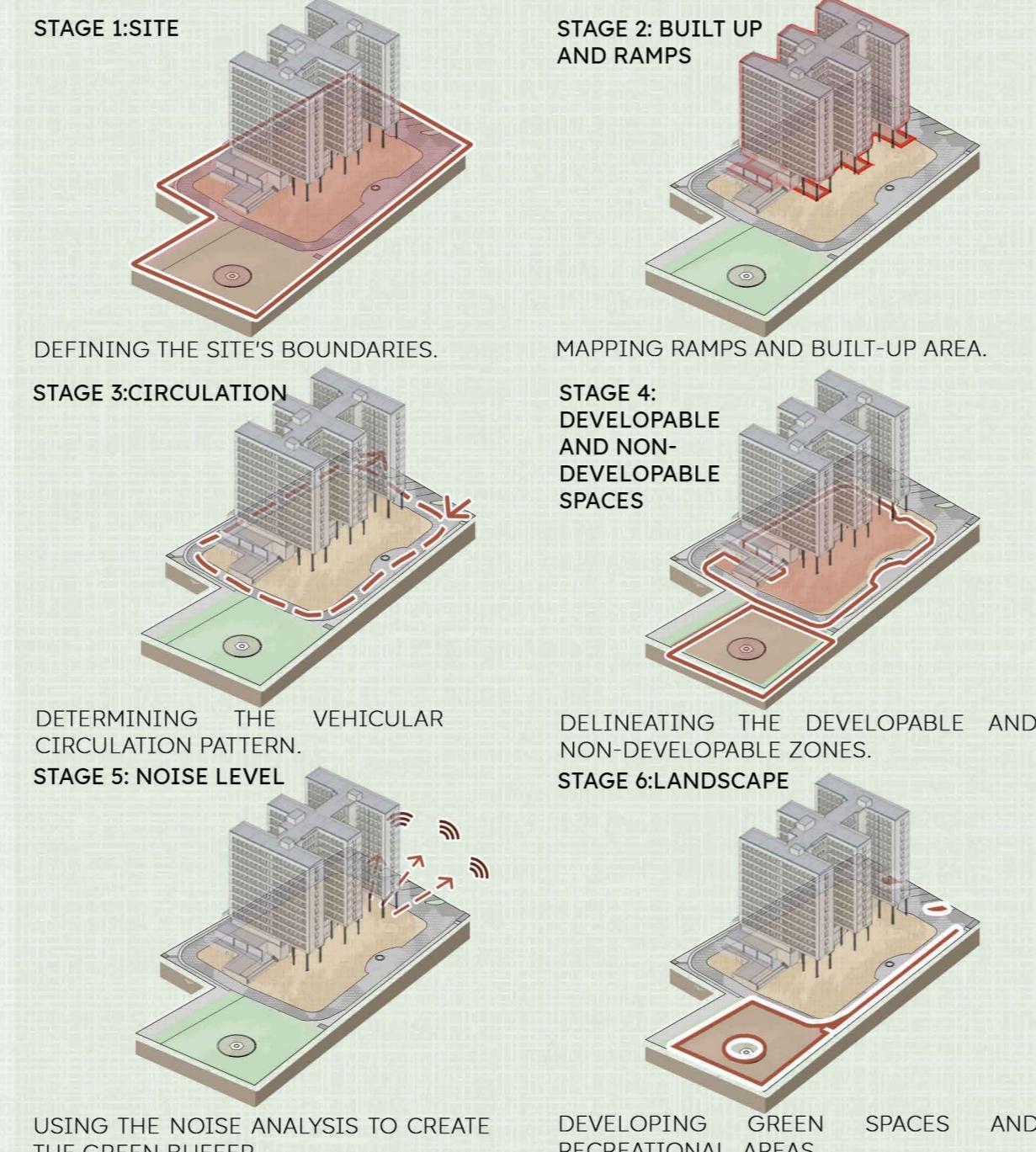


INTERVENTION + INSERT

ADAPTIVE REUSE PROLONG A BUILDING'S LIFE, BY RETAINING ALL OR MOST OF THE BUILDING SYSTEM INCLUDING THE STRUCTURE.



CONTEXTUAL MASSING



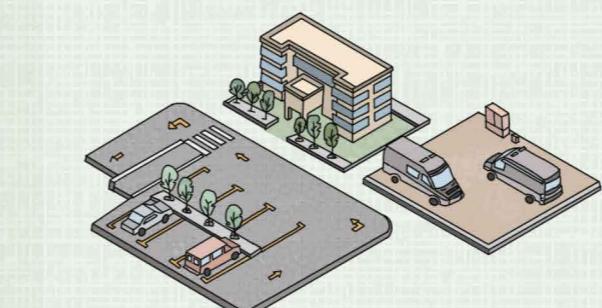
HOSPITAL NORMS

UNIVERSAL ACCESSIBILITY



AN EFFORT OF REMOVING PHYSICAL BARRIERS FROM BUILT ENVIRONMENT FOR PEOPLE WITH DISABILITIES SHOULD BE ENSURED.

DEDICATED PARKING SPACE



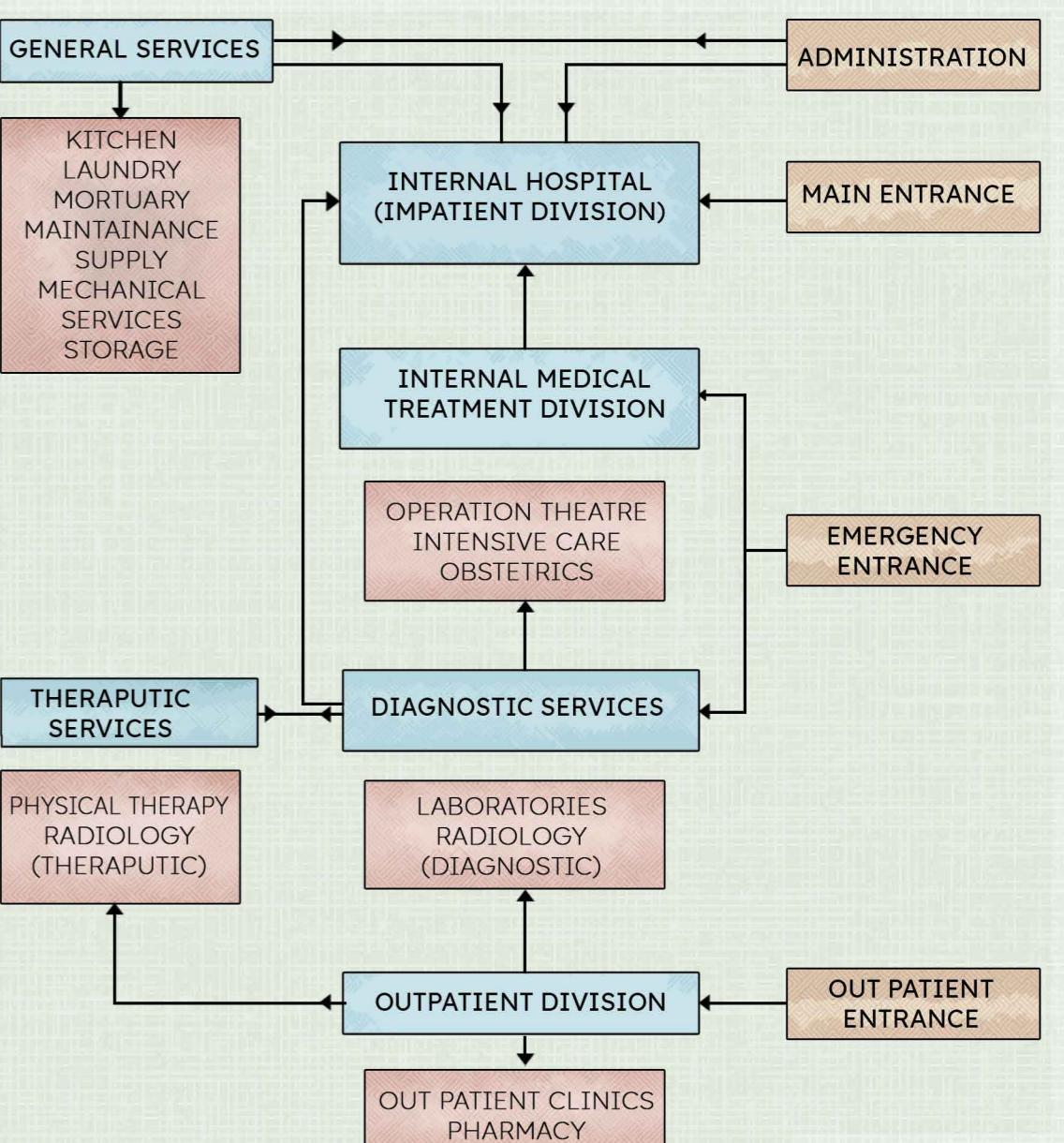
THERE SHALL BE DEDICATED PARKING SPACE FOR AMBULANCE, HOSPITAL STAFF AND VISITORS.

ADEQUATE VISIBILITY



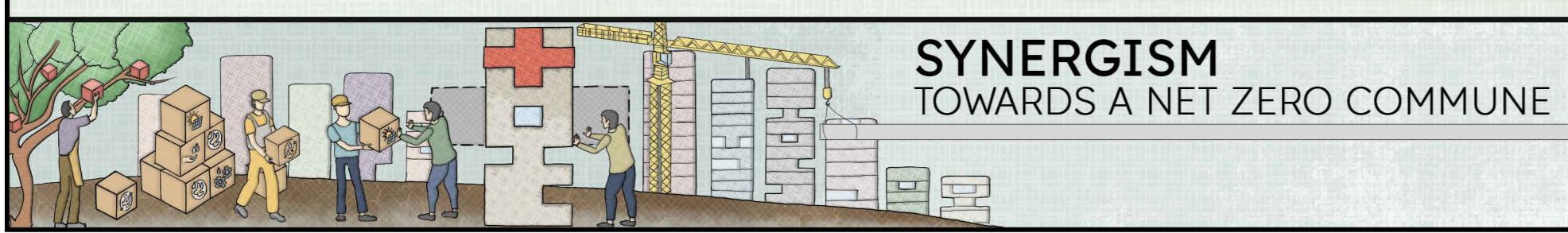
DURING THE NIGHT, THE ROAD SHOULD BE ILLUMINATED.

FLOW OF EMERGENCY WARD



HOSPITAL EMERGENCY SERVICES ARE THE HIGHEST POINT OF ACCESS FOR PATIENTS LOOKING FOR URGENT CARE. HENCE, INTERCONNECTIVITY OF SPACES MATTERS THE MOST.

SYNERGISM TOWARDS A NET ZERO COMMUNE



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65GRIHA-19

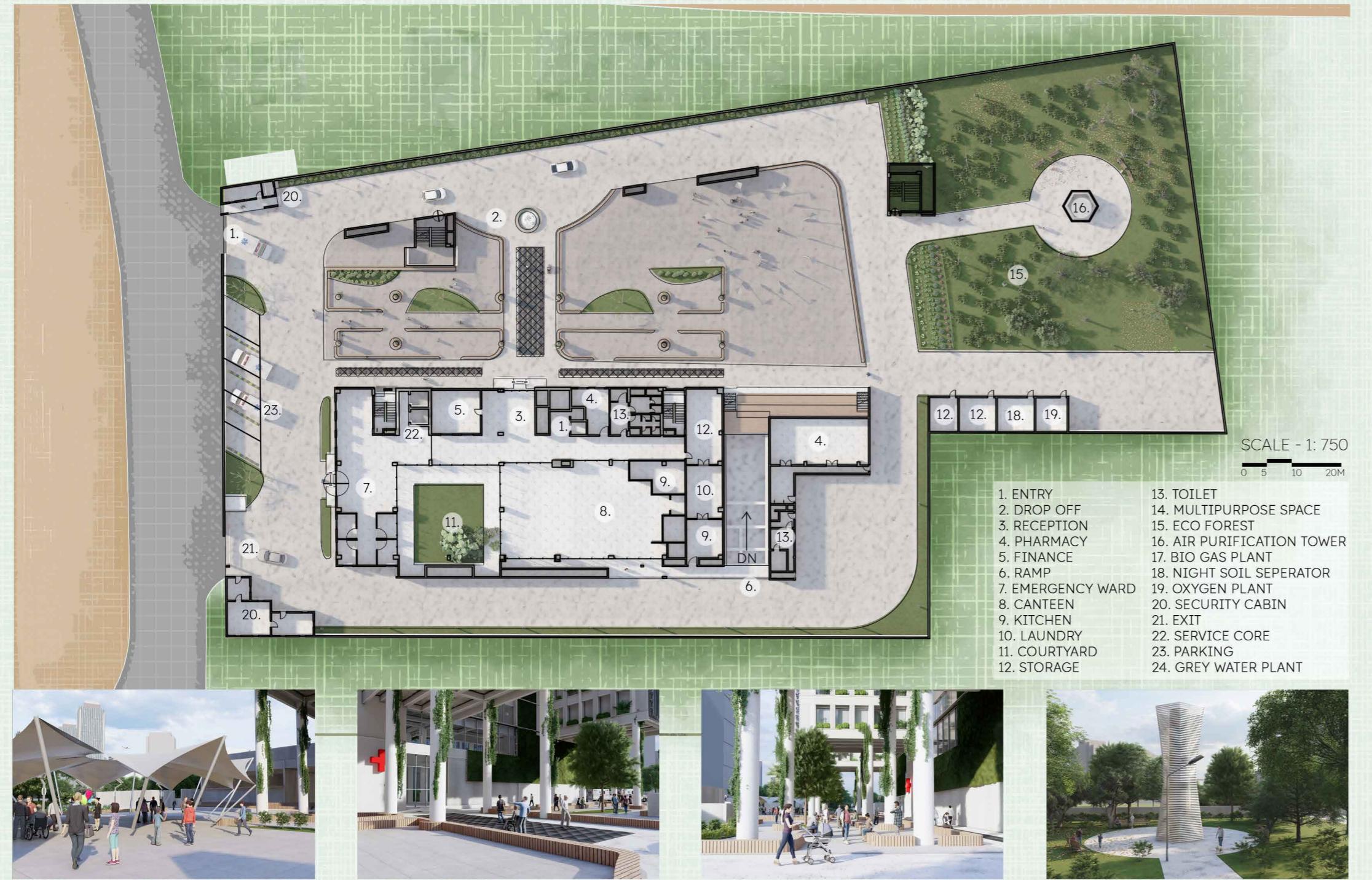


GRIHA Trophy 2022-23

04

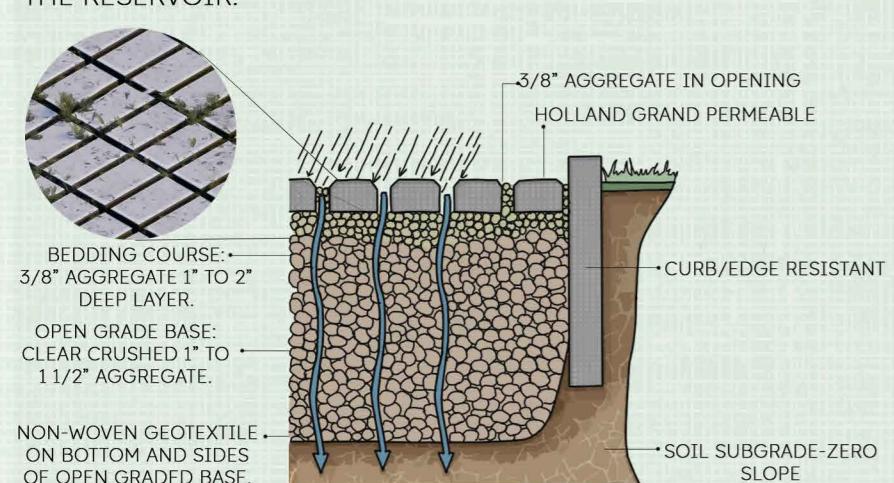
SUSTAINABLE SITE PLANNING

MASTERLAYOUT

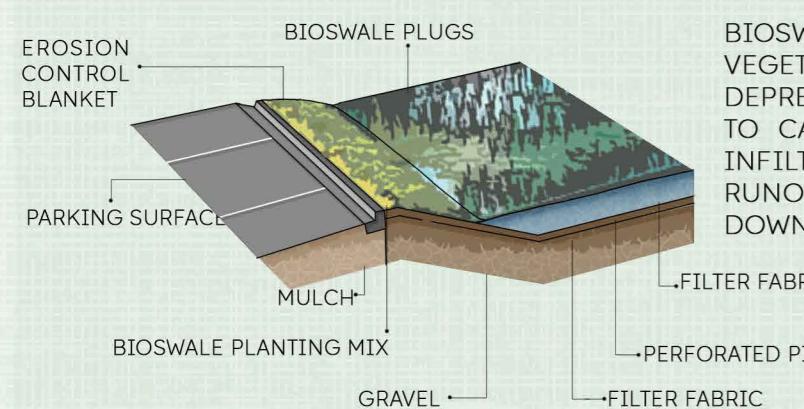


PERMEABLE PAVEMENT

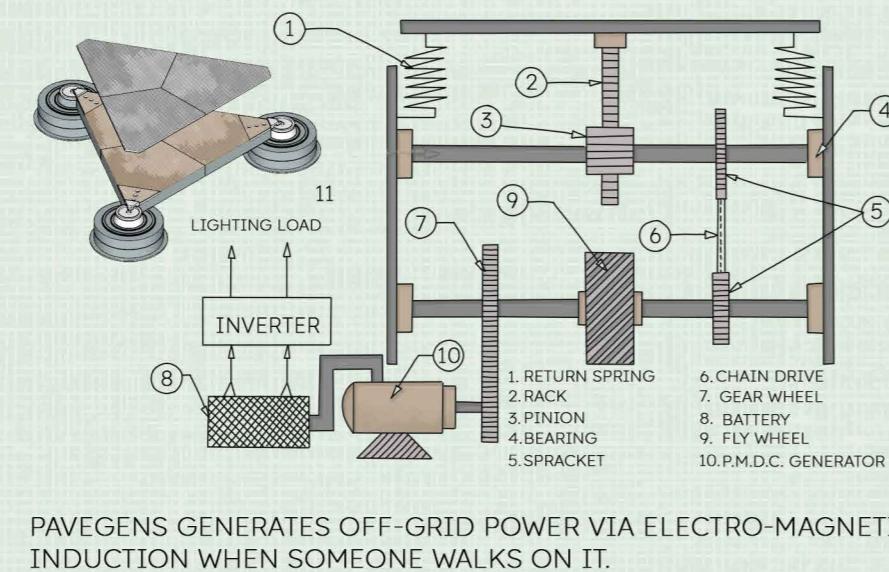
PERMEABLE PAVEMENT IS A POROUS URBAN SURFACE WHICH CATCHES PRECIPITATION AND SURFACE RUNOFF, STORING IT IN THE RESERVOIR.



BIOSWALES



PAVGEN PAVEMENTS



PAVEGENS GENERATES OFF-GRID POWER VIA ELECTRO-MAGNETIC INDUCTION WHEN SOMEONE WALKS ON IT.

ECOForest SECTION



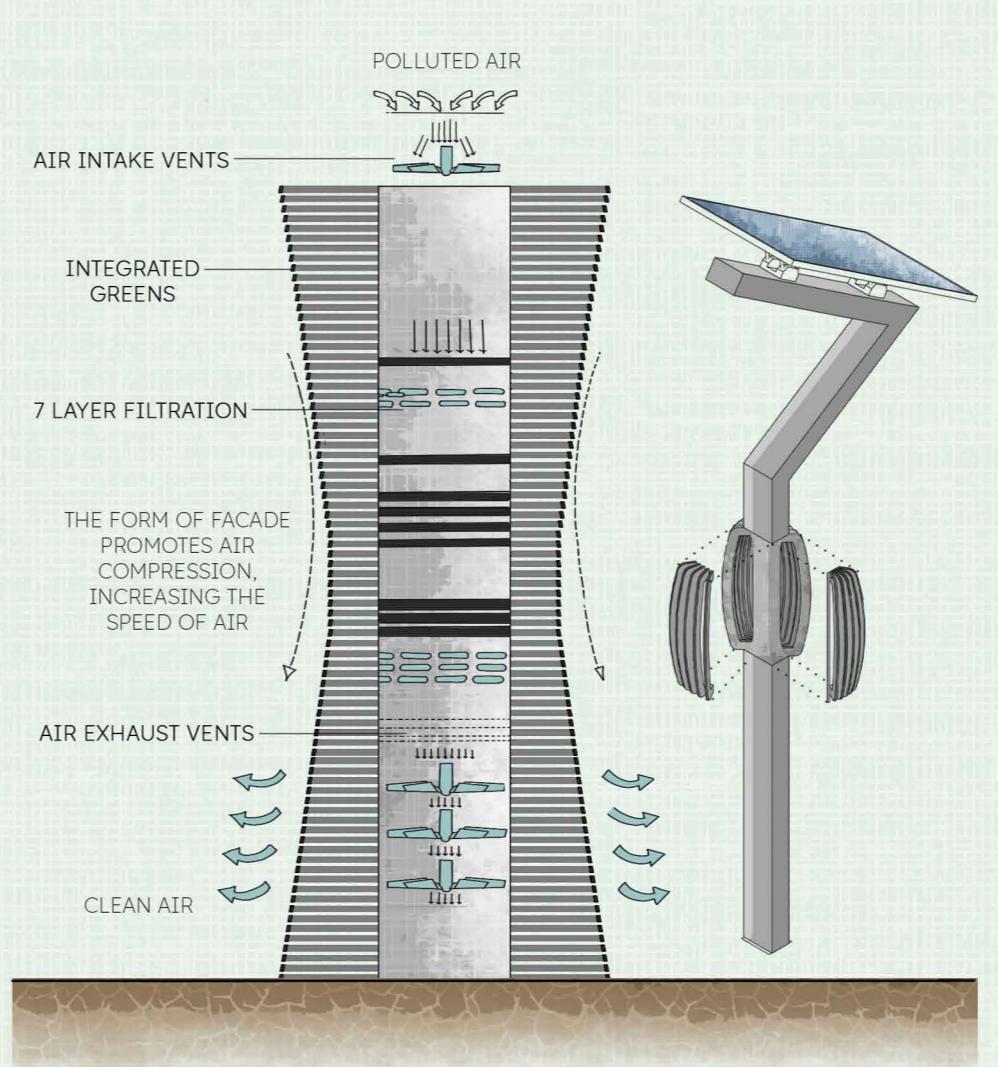
SAFETY PROVISION



DEVELOPEMENT OF ECOFOREST

PLANTS PRODUCING OXYGEN	
PLANTS	USES
POTHOS	REDUCED CO ₂ FROM 454PPM TO 425PPM
ARECA PALM	REMOVES POLLUTANTS AS XYLENE, BENZENE AND TOLUENE
SNAKE PLANT	ABSORBS 1 LITRE OXYGEN PER DAY
PEACE LILY	GOOD AT REFINING BENZENE AND TRICHLOROETHYLENE
ALOE VERA	RELEASES OXYGEN AT NIGHT
TULSI	PRODUCES OXYGEN FOR 20 HRS A DAY
WEEPING FIG	FILTERS HAZARDOUS VOC
SPIDER PLANT	PRODUCES 2.4L PER DAY
GERBERA DAISY	RELEASES OXYGEN AT NIGHT AND PURIFIES AIR
MONEY PLANT	PRODUCES 900ML-1L OXYGEN PER DAY
SACRED FIG	ONE TREE PRODUCES NEARLY 260 POUNDS OF OXYGEN EACH YEAR
CURRY TREE	HIGHEST OXYGEN RELEASING TREE
BAEL TREE	ABSORBS POISONOUS AND CHEMICAL POLLUTANTS
JAMUN TREE	ABSORBS GASES LIKE SULPHURDIOXIDE AND NITROGEN
LAVENDER	PRODUCES OXYGEN AND SURROUNDS FRESH ENVIRONMENT
ALSTONIA SCHDARIS	PURIFIES POLLUTANTS FROM AIR
CHAMADOREA ELEGANS	GOOD PURIFIER AND MOST UNDEMANIND PLANT IN TERMS OF WATER AND AIR
DUMB CANES	BEST CARBON DIOXIDE ABSORBER AND EASY TO MAINTAIN
RHAPIS	REMOVES AIR TOXINS INCLUDING AMMONIA

AIR PURIFIER

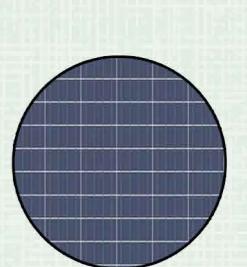


MEDICINAL PLANTS	
PLANTS	USES
INDIAN GOOSEBERRY	ANTI-CANCER EFFECT
CENTELLA ASIATICA	LEPORSY AND PSORIASIS
ASPARAYUS	CONSTIPATION AND TUBERCLOSIS
MORINGA	LOWERS CHOLESTROL
COMMON SAGE	REDUCES BLOOD PRESURE
FEWER JEW	TREATMENT OF FEVER
ASHOKA TREE	PREVENTS DIABETES
AJWAIN	TREATS STOMACH DISORDER
HALDI	TISSUE REPAIR AND ANTI-INFLAMMATORY
KALA BANSA	ANTI-FERTILITY AND ANTI-LEPSY
BABOOL	ORAL CURE
INDIAN BLELIUM	JOINT DISORDER AND HEART DISEASE
MONKS HOOD	FEVER AND ARTHRITIS
LONG PEPPER	ASTHAMA AND COUGH
VELVET LEAF	SINUSES AND SKIN DISEASE
ARJUNA TREE	REDUCES HEART DISEASE
CINNAMON	TREATS ASTHAMA AND CARDIAC DISORDER
MARIGOLD	HELPS IN DIGESTIVE PROBLEMS
BLACKBOARD TREE	HEALS ULCERS

PERFORMANCE	
VOLUME	DEPENDING ON AIR FLOW
AIRFLOW	USES NATURAL AIR FLOW
RADIUS	6-7M
REDUCTION	20-40% PM10, PM2.5, PM0.1
NOISE LEVEL	SILENT - ODBA



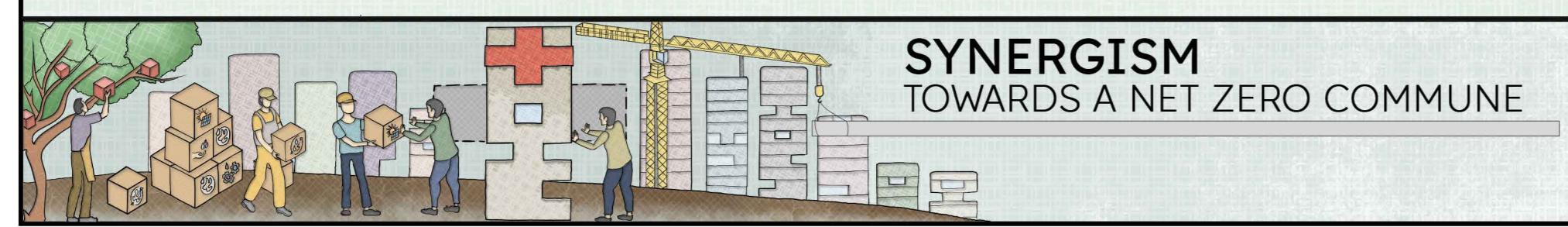
ELECTRIC SPECS	
POWER SUPPLY	SOLAR POWERED
POWER CONSUMPTION	18 WATT



AIR QUANTITY	
AIR PURIFIER PER HOUR	0.5m ³
AIR PURIFIED PER DAY	1440m ³
TOTAL AIR PURIFIED	5,18,400m ³
TOTAL AIR PURIFIED ANNUALLY	

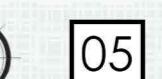


AIR PURIFICATION TOWERS ARE DESIGNED TO REDUCE AIR POLLUTION. THE AIR FLOWING THROUGH THE TOWER PASSES THROUGH A FILTER TO PROVIDE CLEAN AIR COMING OUT OF IT.



SYNERGISM
TOWARDS A NET ZERO COMMUNE

ALL DIMENSIONS ARE IN MM*



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GRIHA Trophy 2022-23

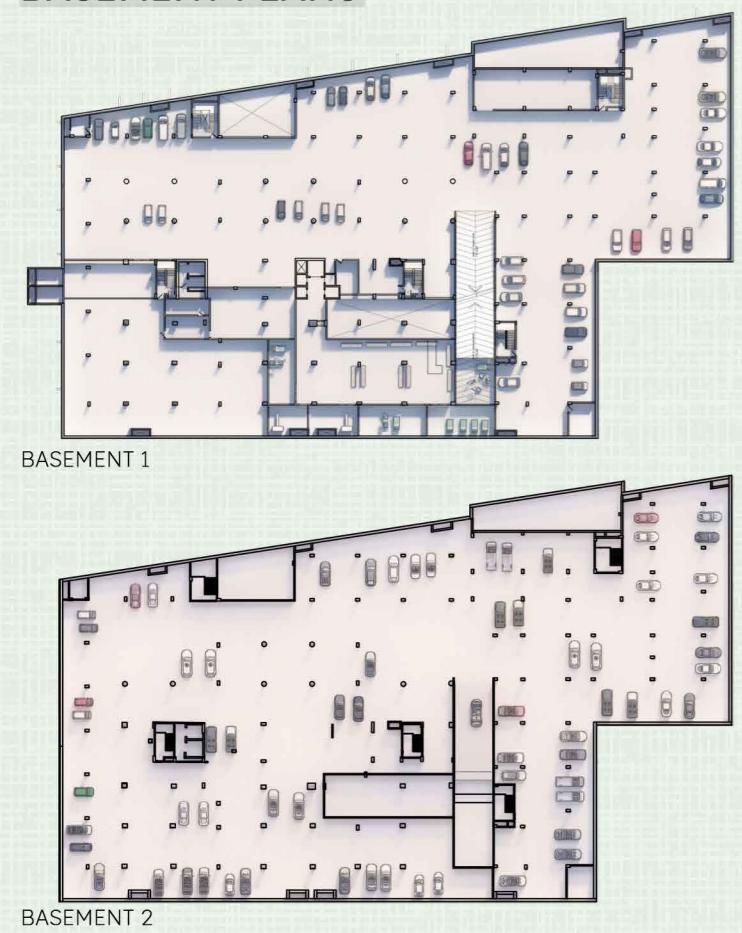


DESIGN DEVELOPMENT

AREA STATEMENT

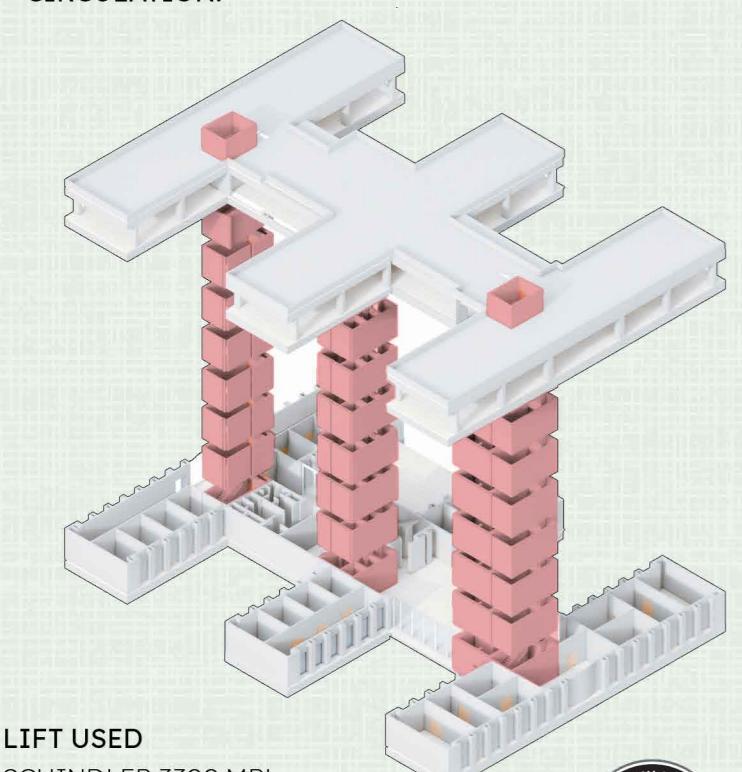
SPACE	AREA (IN SQ. METERS)
TOTAL PLOT AREA	11,000
BUILT-UP AREA	36,730
GROUND FLOOR	2,000
SERVICES	1820.6
BUILT VS OPEN RATIO	18:82
PARKING	11,735

BASEMENT PLANS



VERTICAL CIRCULATION

THERE EXIST 3 LIFT CORES WITHIN THE HOSPITAL, PLACED CENTRALLY FOR ENSURING EASY CIRCULATION.

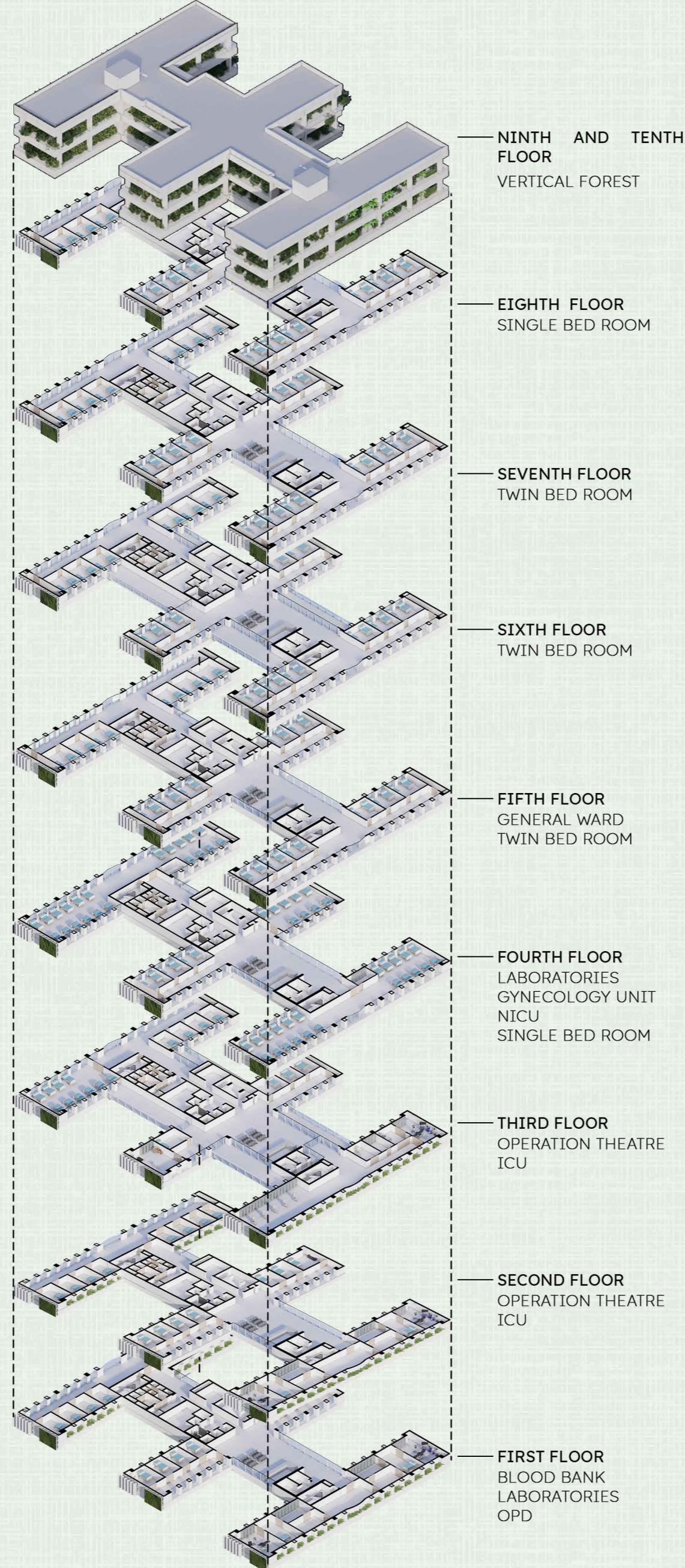


LIFT USED
SCHINDLER 3300 MRL TRACTION ELEVATOR
QUANTITY OF LIFT : 7
COST : 7*50,00,000 = 3,50,00,000

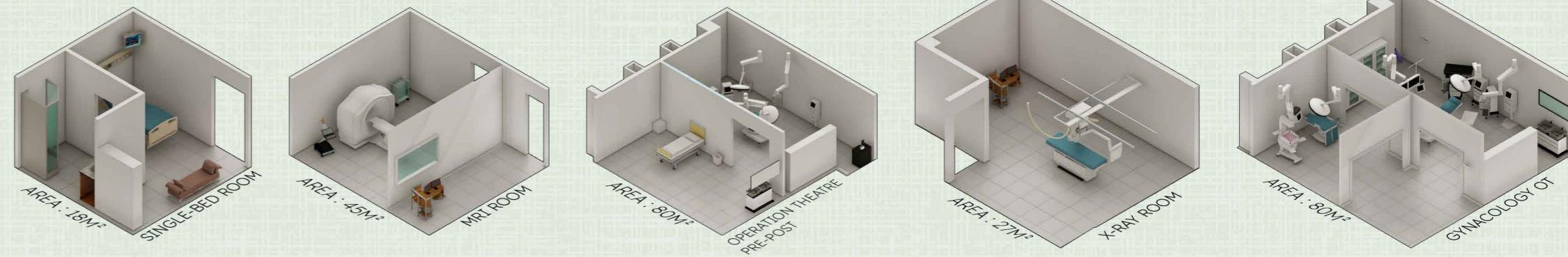


LEED CERTIFIED RATINGS		
ENERGY AND ATMOSPHERE	MATERIAL AND RESOURCES	INDOOR AIR QUALITY
OPTIMIZE ENERGY PERFORMANCE	CONSTRUCTION WASTE MANAGEMENT	LOW-EMITTING MATERIALS: ADHESIVES AND SEALANTS

FLOOR PLATES



HOSPITAL COMPONENTS



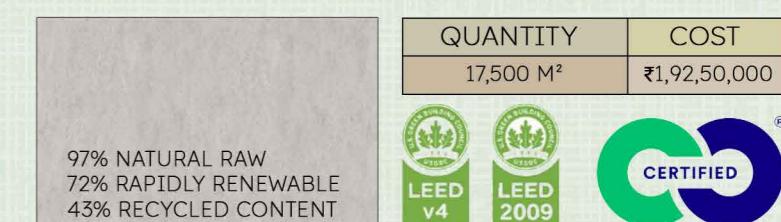
EXTERIOR PAINT - BIOSPHERE PREMIUM



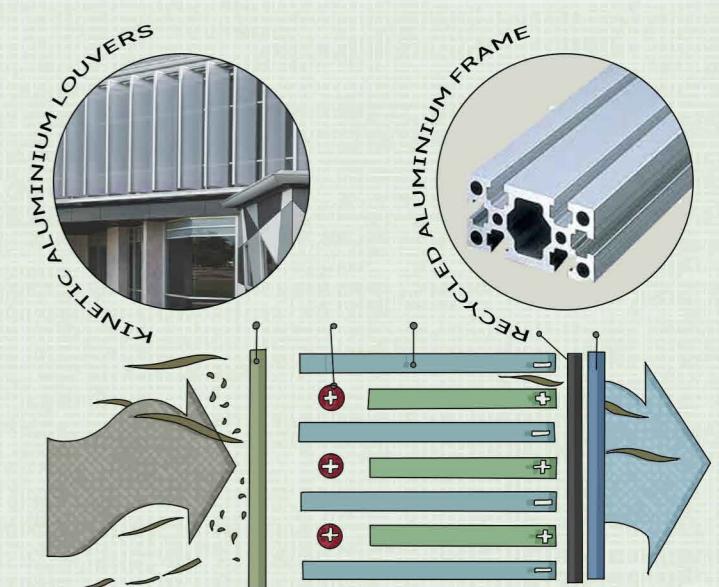
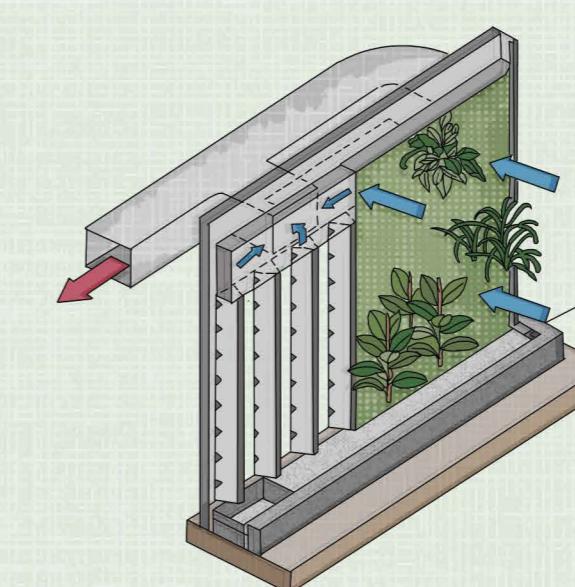
AGRI-PAINT (BIO-ACRYLIC PAINT) - INTERIOR



FLOORING : MARMOLEUM OHMEX



FACADE



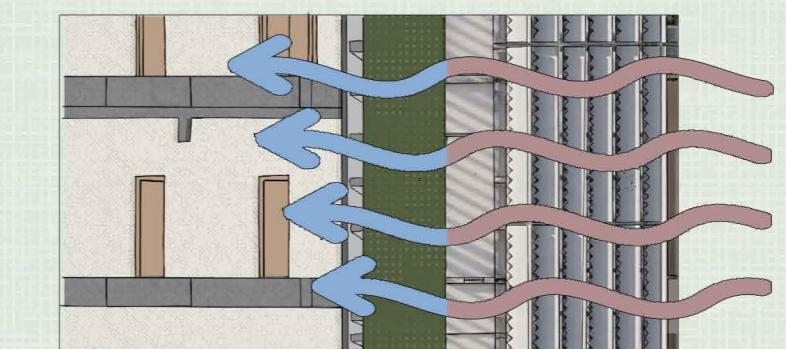
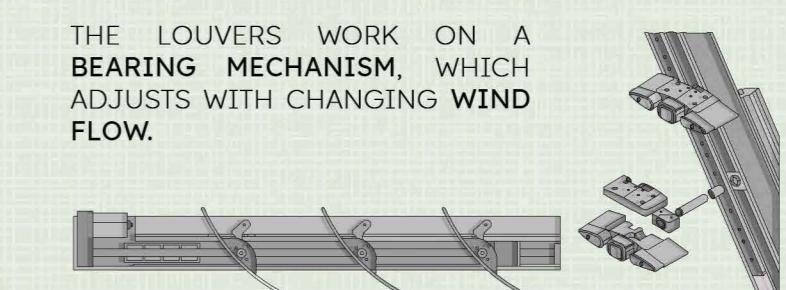
ENVIRONMENTAL PROFILE	NORMAL WALL (%)	GREEN WALL (%)
HEATING	100	79
INDOOR AIR QUALITY IMPROVEMENT	0	55
NOISE REDUCTION	12	57
REDUCTION IN ENERGY USE	12	60

BENEFITS

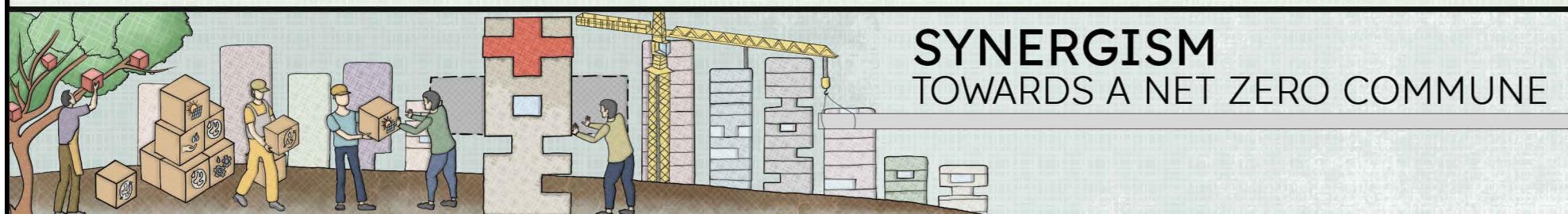


MECHANISM

THE LOUVERS WORK ON A BEARING MECHANISM, WHICH ADJUSTS WITH CHANGING WIND FLOW.

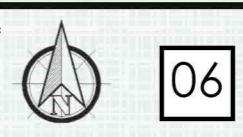


THE NORTH, SOUTH AND EAST FACADES ARE AFFIXED WITH PANELS OF VERTICAL GREEN WALLS AND MECHANICAL LOUVERS. THE COLLECTED AIR BY LOUVERS IS FILTERED AND UTILISED IN HVAC SYSTEM.



SYNERGISM
TOWARDS A NET ZERO COMMUNE

ALL DIMENSIONS ARE IN MM*

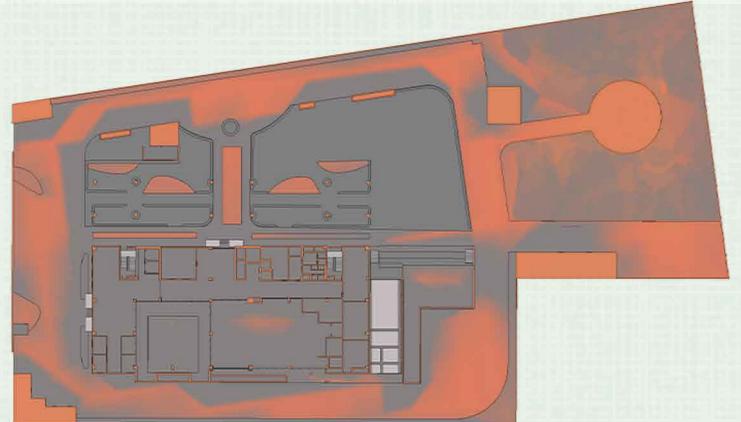


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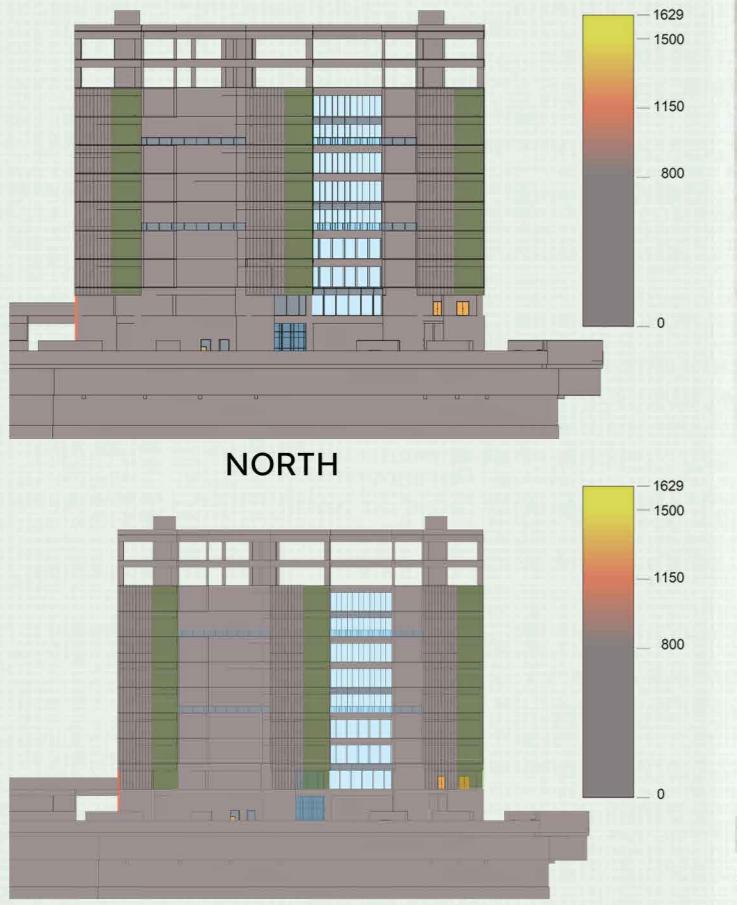


DAYLIGHT ILLUMINANCE



DAYLIGHT ILLUMINANCES IN THE RANGE 300 TO AROUND 3,000 LUX ARE OFTEN PERCEIVED AS DESIRABLE.

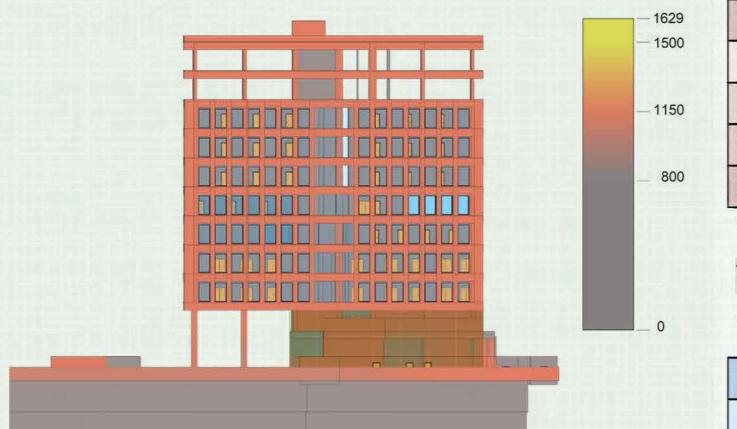
SOLAR HEAT GAIN



SOUTH



EAST



WEST

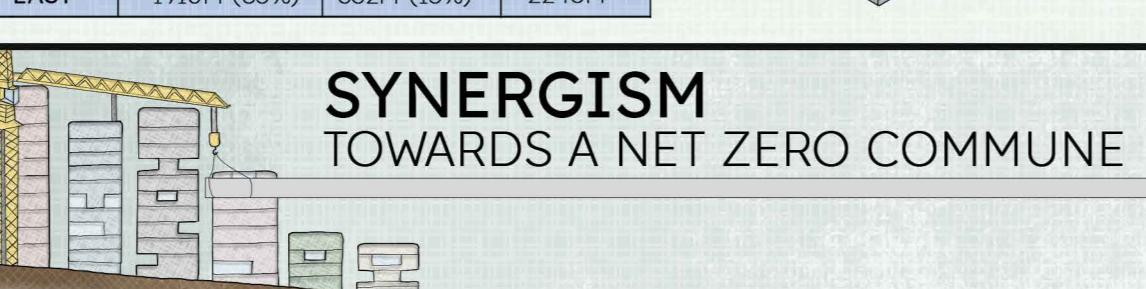
THE WESTERN FAÇADE OF THE STRUCTURE EXPERIENCES THE HIGHEST SOLAR HEAT GAIN.

OCCUPANT COMFORT

LIGHT EFFICIENCY

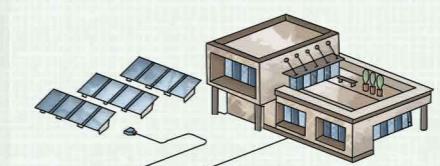


SR.NO	SPACES	QTY	PER UNIT AREA	TOTAL AREA	FLUX	REQUIRED LUMENS	Fixture	No. of Fixtures	Consumption
1	RECEPTION	1	60	60	150	9000	L1	10	125
2	PASSAGE	1	150	150	150	22500	L1	25	312.5
3	RECEIVING AREA	1	35	35	150	5250	L1	6	75
4	KITCHEN STORAGE	1	45	45	150	6750	L1	8	100
5	MEDICINAL STORAGE	1	50	50	150	7500	L1	9	112.5
6	SECURITY CABIN	1	10	10	150	1500	L1	2	25
7	KITCHEN	1	50	50	150	7500	L1	9	112.5
8	DINING	1	360	360	150	54000	L1	60	750
9	PHARMACY	2	30	60	150	9000	L1	10	125
10	FINANCE	1	50	50	150	7500	L1	9	112.5
11	WASHROOM	10	45	450	200	90000	L1	100	1250
12	MISCC	1	270	270	150	40500	L1	45	562.5
13	SERVICE CORE	2	770	1540	150	231000	L2	93	1534.5
14	LABORATORY	1	130	130	750	97500	L4	10	1500
15	BLOOD BANK	1	40	40	250	10000	L1	12	150
16	WAITING	1	120	120	150	18000	L1	20	250
17	CAFE	1	360	360	150	54000	L1	60	750
18	BASEMENT II	1	8000	8000	100	800000	L2	320	5280
19	BASEMENT I	1	6950	6950	100	695000	L2	278	4587
20	SIMPLE WARDS	66	12	792	100	198000	L1	220	2750
21	TWIN ROOM	36	25	900	250	225000	L1	250	3125
22	SINGLE ROOM	23	18	414	250	103500	L1	115	1437.5
23	ICU	30	20	600	250	150000	L1	167	2087.5
24	NICU	1	150	150	250	37500	L1	42	525
25	GYNAEKOLOGY UNIT	1	170	170	250	85000	L1	95	1187.5
26	OPD	24	23	552	500	276000	L1	307	3837.5
27	EMERGENCY DEPARTMENT	1	253	253	500	126500	L3	55	1210
28	OPERATION THEATRE	4	48	192	500	384000	SP	4	43733
29	PRE-POST UNITS	4	31	124	20,000	62000	L3	27	594
30	STERILE PROCESSING				500				
31	DEPARTMENT	4	25	100	500	50000	L3	22	484
32	SURGICAL SERVICES	1	30	30	150	4500	L1	5	62.5
33	MRI	1	90	90	200	18000	L1	20	250
34	ULTRA SOUND ROOM	1	18	18	200	3600	L1	4	50
35	MORGUE ROOM	1	57	30	300	14400	L1	16	200
36	AUTOPSY ROOM	1	20	20	500	10000	L3	5	110
37	SECURITY ROOM	1	20	20	150	3000	L1	4	50
									TOTAL 79407.5



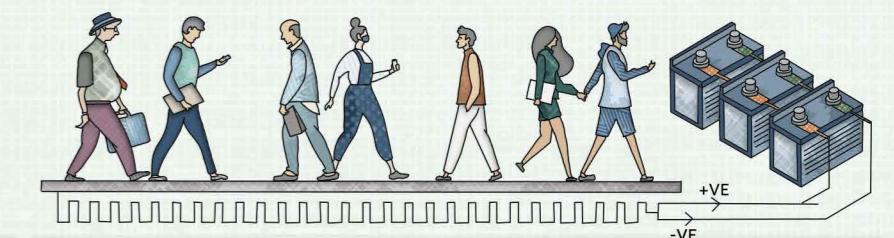
ENERGY OPTIMISATION

SOLAR PANELS



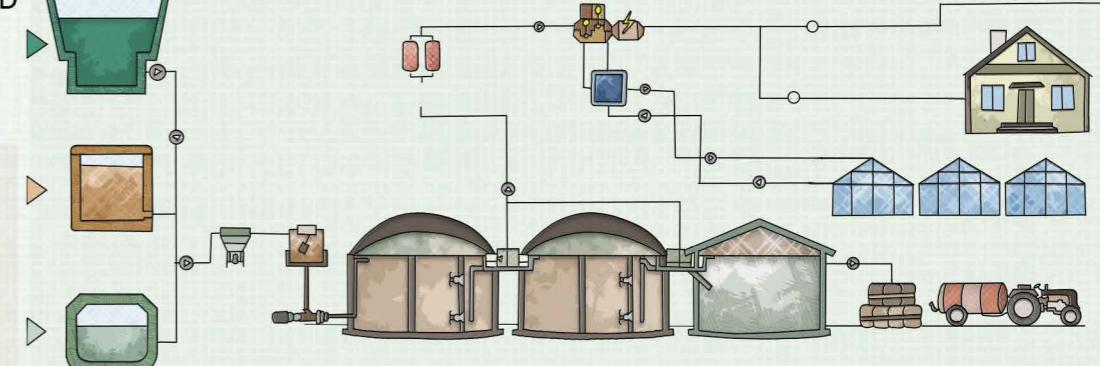
TYPOLOGY : 96 CELL PANELS
SOLAR PANEL SIZE : 1.6M X 1.0M
ANGLE OF INCLINATION : 40°
LOCATION : NOIDA, NEW DELHI
SOLAR HOURS : 4 HOURS
ENVIRONMENT FACTOR : 90%
ROOF AREA : 1,800SQ.M
NO OF PANELS : 1,200 PANELS
ENERGY PER PANEL : 320W

PAVEGEN PAVEMENTS



TOTAL AREA OF PAVEGEN : 135SQ.M
DIMENSION OF PAVEGEN TILE : 0.3M X 0.3M (AREA = 0.09SQ.M)
NUMBER OF TILES : 135/0.09 = 1500 TILES
AVERAGE DISTANCE A PERSON TRAVELS : 20M
AVERAGE STEP OF A PERSON : 0.5M
TOTAL STEPS : 80M (WITH RETURN JOURNEY)
ENERGY PRODUCTION : 2W/STEP
FOOTFALL : 200/DAY (ON PAVEGEN)
TOTAL PRODUCED ENERGY : 80 X 2 X 200 = 3,200W
CONVERSION : 380KWH (12 HOURS PER DAY)

BIOGAS PLANT



BIOGAS IS AN ENVIRONMENTALLY-FRIENDLY, RENEWABLE ENERGY SOURCE.
IT'S PRODUCED WHEN ORGANIC MATTER, SUCH AS FOOD OR ANIMAL WASTE,
IS BROKEN DOWN BY MICROORGANISMS IN THE ABSENCE OF OXYGEN.

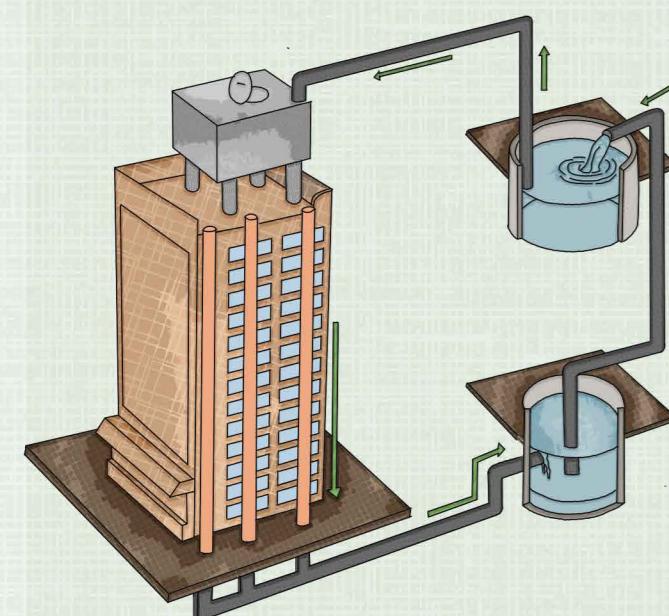


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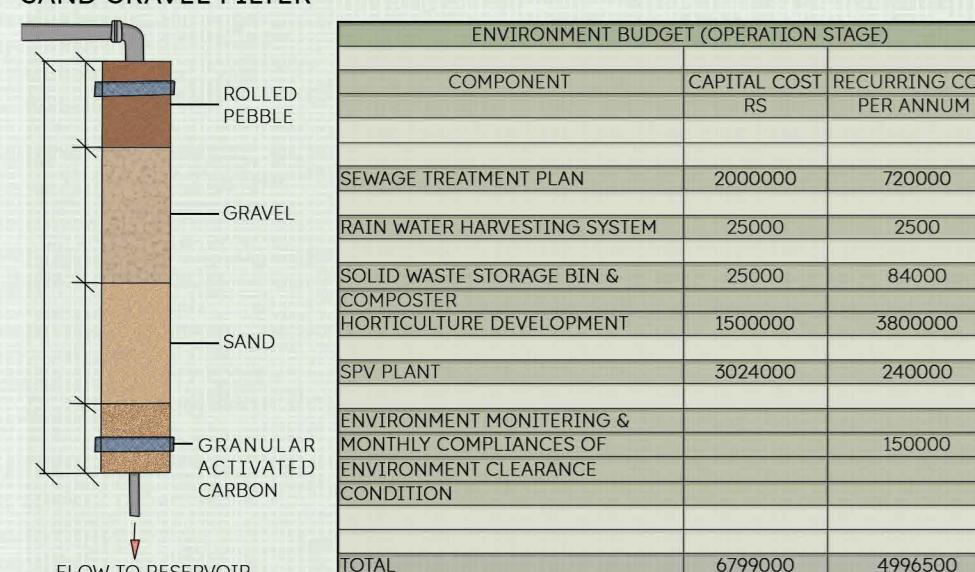
WATER MANAGEMENT

ROOFTOP RAINWATER HARVESTING

IT IS A TECHNIQUE THROUGH WHICH RAIN WATER IS CAPTURED FROM THE ROOF CATCHMENTS AND STORED IN RESERVOIRS.



SAND GRAVEL FILTER



USES

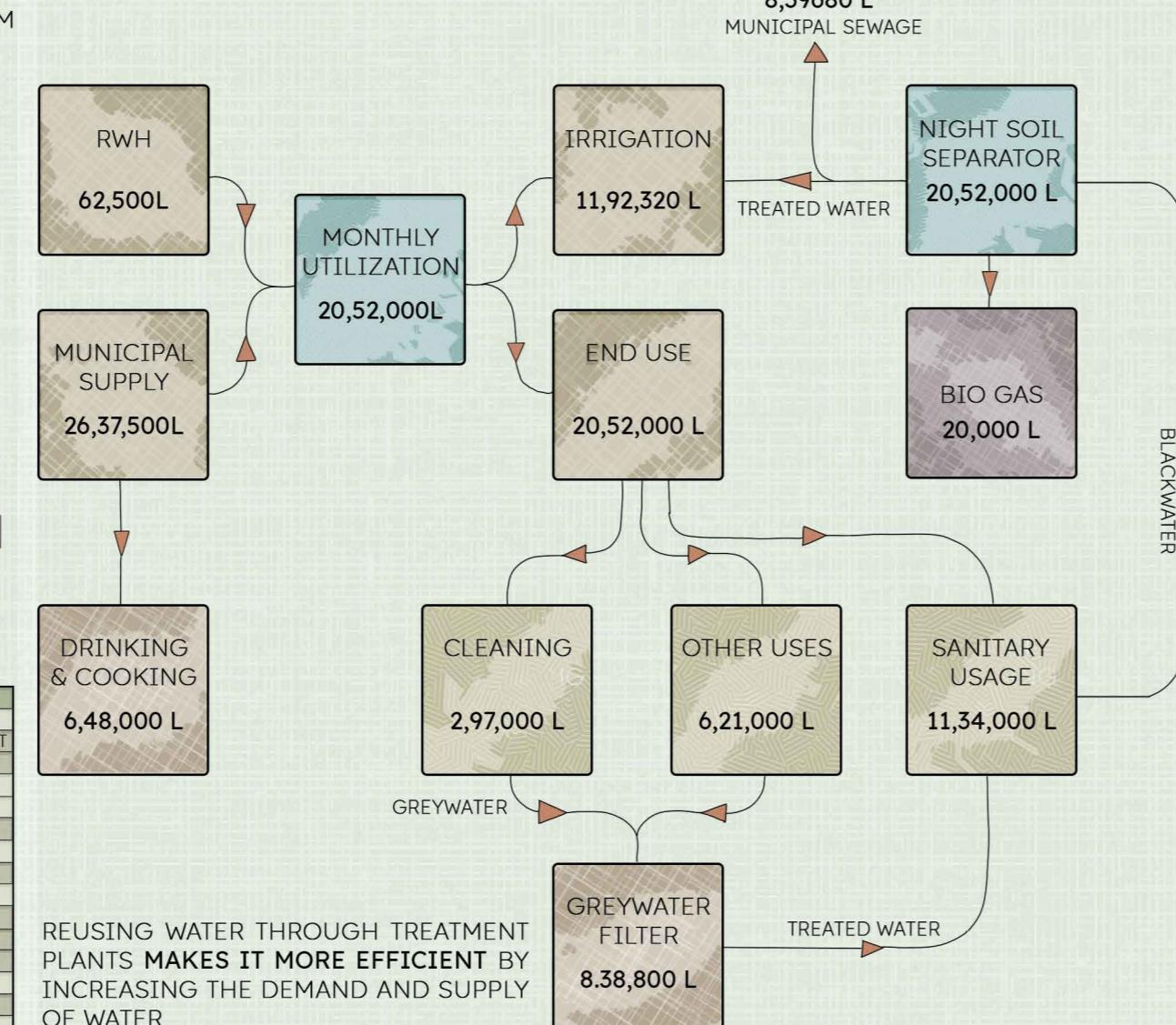


HARVESTED RAIN WATER CAN BE STORED IN SUB-SURFACE GROUND WATER RESERVOIR TO MEET THE HOUSEHOLD NEEDS.

SOLID WASTE MANAGEMENT



WATER CYCLE



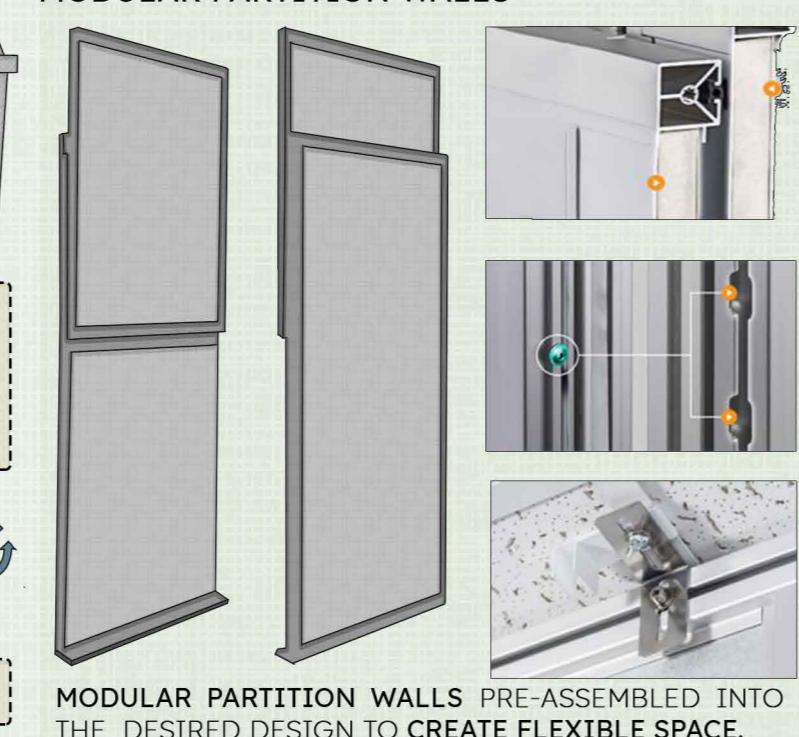
WATER DEMAND REDUCTION

INSTALLING LOW FLOW FIXTURES, WATER SAVING TOILET AND IRRIGATION SYSTEMS AND EFFICIENT HVAC SYSTEM REDUCES THE WATER CONSUMPTION.

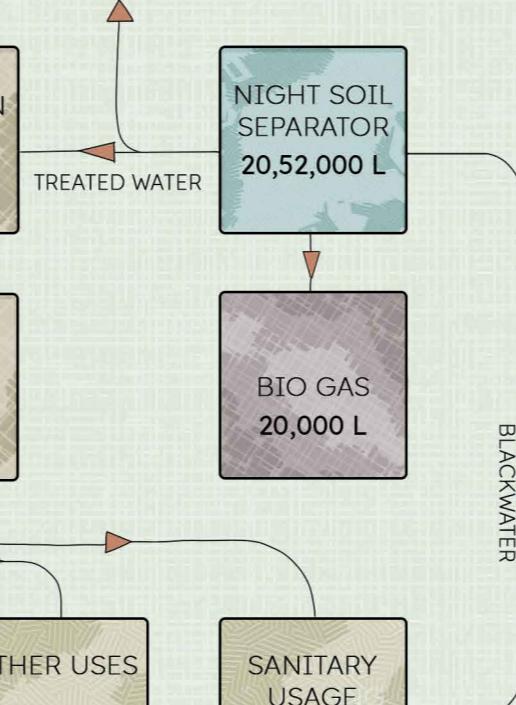
LOW FLOW FIXTURES	DRIP IRRIGATION SYSTEM	HVAC OPTIMISATION	LOW-FLUSH TOILET
LOW FLOW TAPS(AERATOR): 2 LITRES/MIN	EFFICIENCY OF DRIP IRRIGATION: 90-95%	HVAC OPTIMISATION: 8 TO 10 LITRES PER TON-HOUR	WATER SAVINGS: 67% FULL FLUSH:1.6 HALF FLUSH:0.8

SUSTAINABLE BUILDING MATERIALS

MODULAR PARTITION WALLS

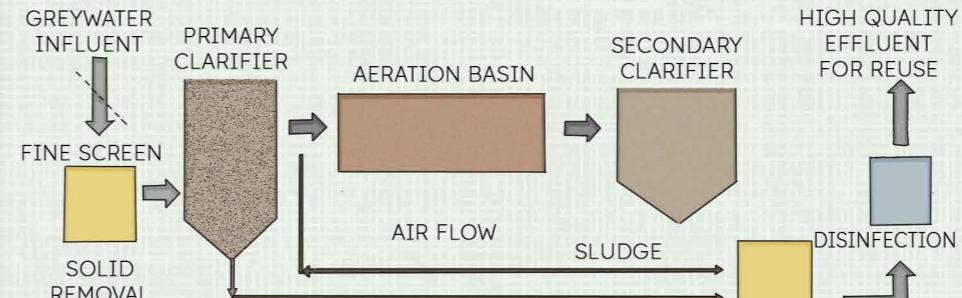


WATER CYCLE

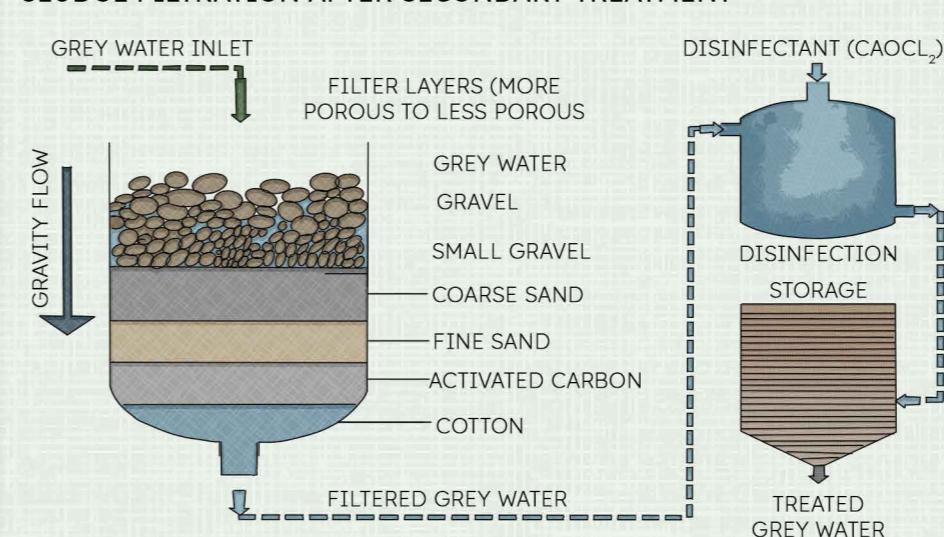


GREYWATER MANAGEMENT

GREY WATER REUSE IS A POTENTIAL WAY OF REDUCING THE CONSUMPTION OF POTABLE WATER IN BUILDINGS.



SLUDGE FILTRATION AFTER SECONDARY TREATMENT

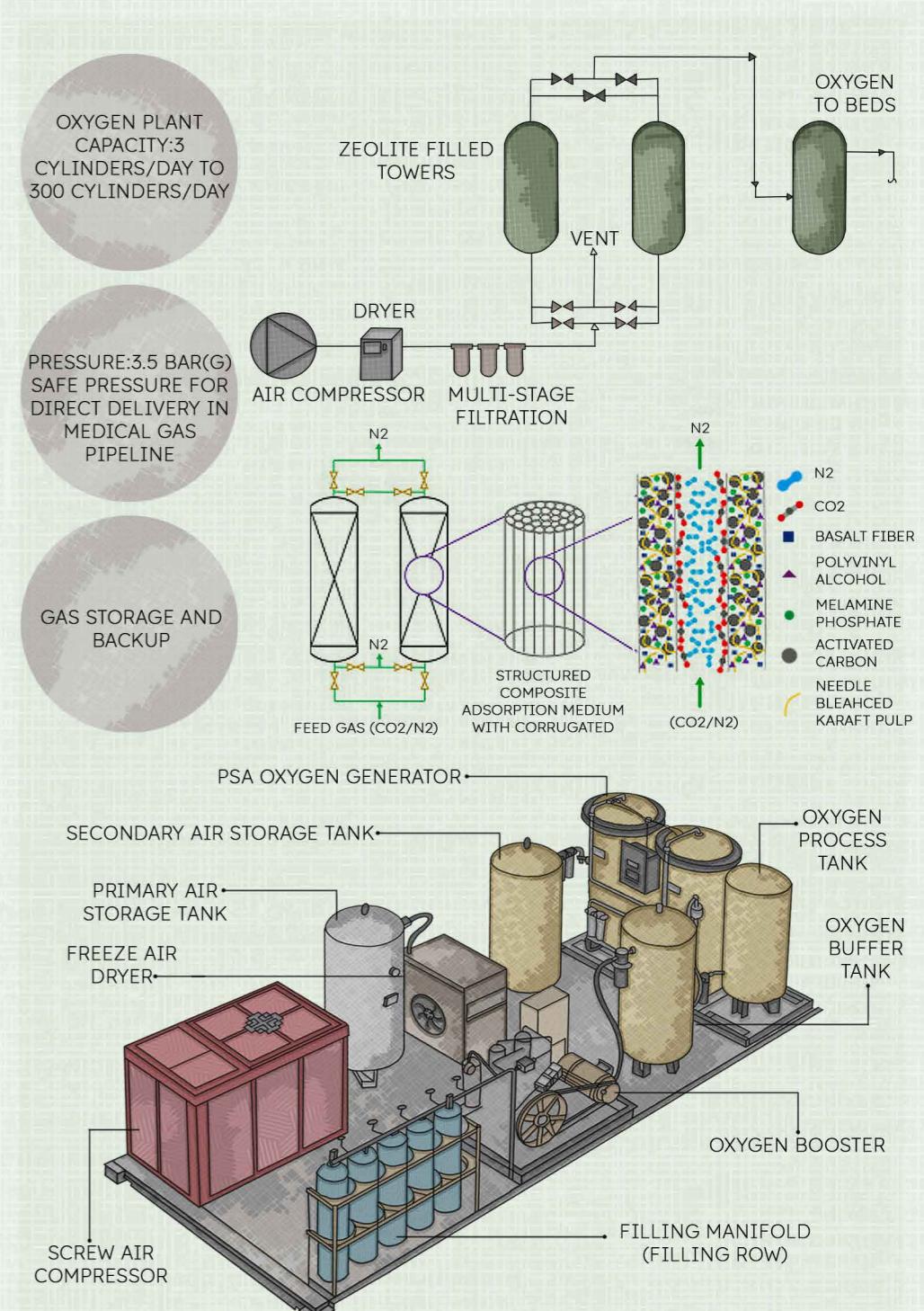


BLACKWATER MANAGEMENT

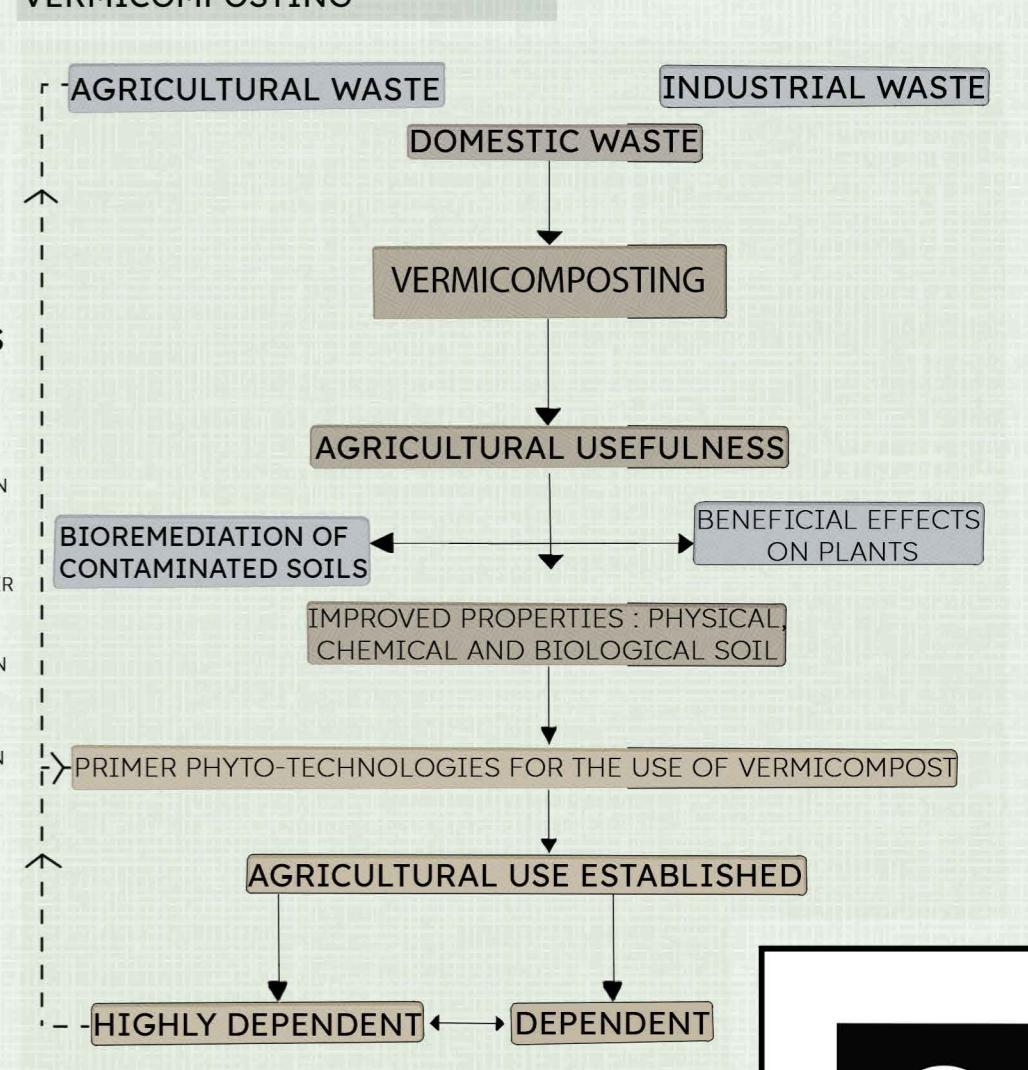


BLACKWATER IS THE WASTEWATER FROM BATHROOMS AND TOILETS THAT CONTAINS FAECAL MATTER AND URINE THAT FILTERS THE WATER FOR ITS REUSE.

OXYGEN GENERATOR PLANT



VERMICOMPOSTING



SYNERGISM TOWARDS A NET ZERO COMMUNE

GRIHA Trophy 2022-23

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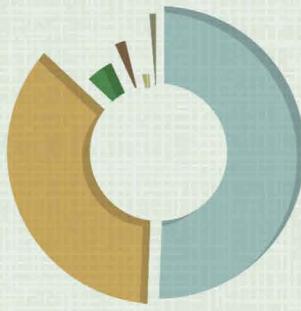
Registration code:
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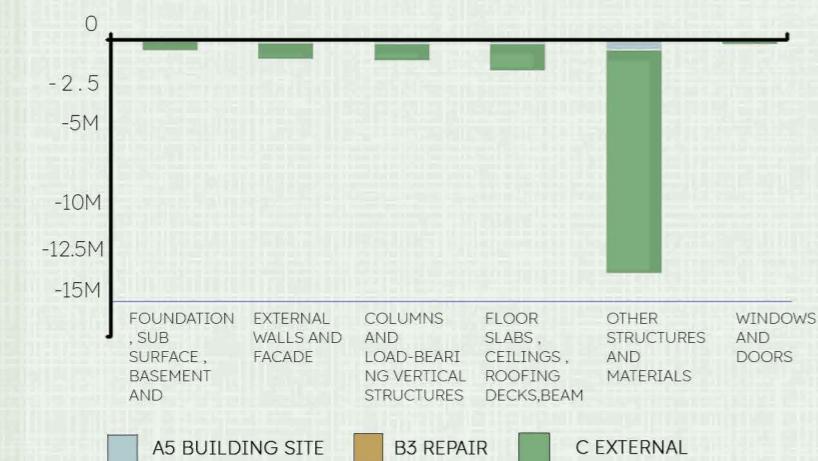
LIFE CYCLE ANALYSIS

LCA : LIFE CYCLE ASSESSMENT

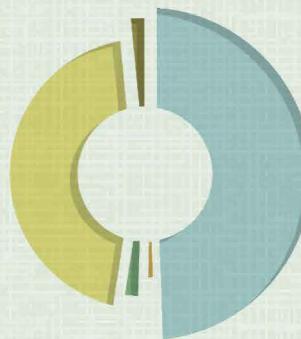
NET CARBON KG CO₂E - CLASSIFICATIONS



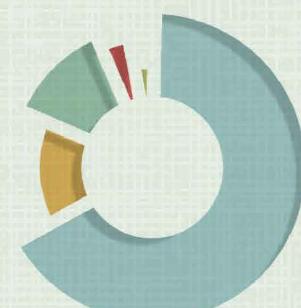
CARBON SAVINGS FROM MATERIAL REUSE (CARBON SAVINGS FROM MATERIAL REUSE)



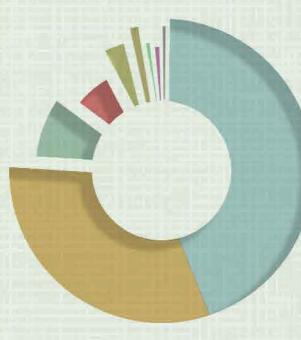
NET CARBON KG CO₂E - LIFE-CYCLE STAGES



MASS KG - CLASSIFICATIONS

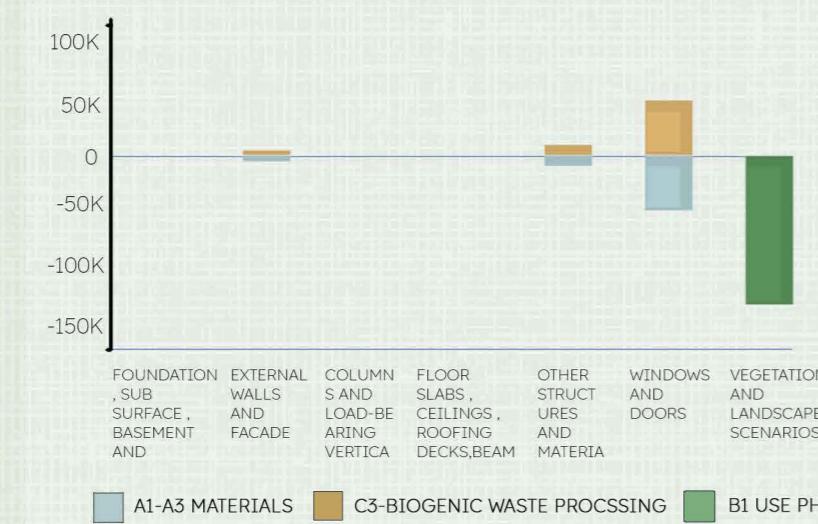


NET CARBON KG CO₂E - RESOURCE TYPES

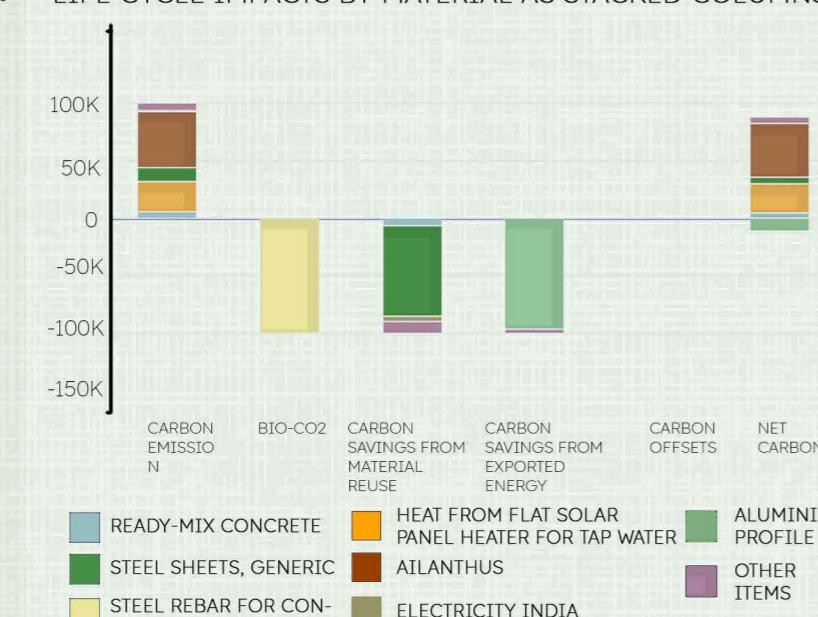


NET CARBON KG CO₂E - CLASSIFICATIONS

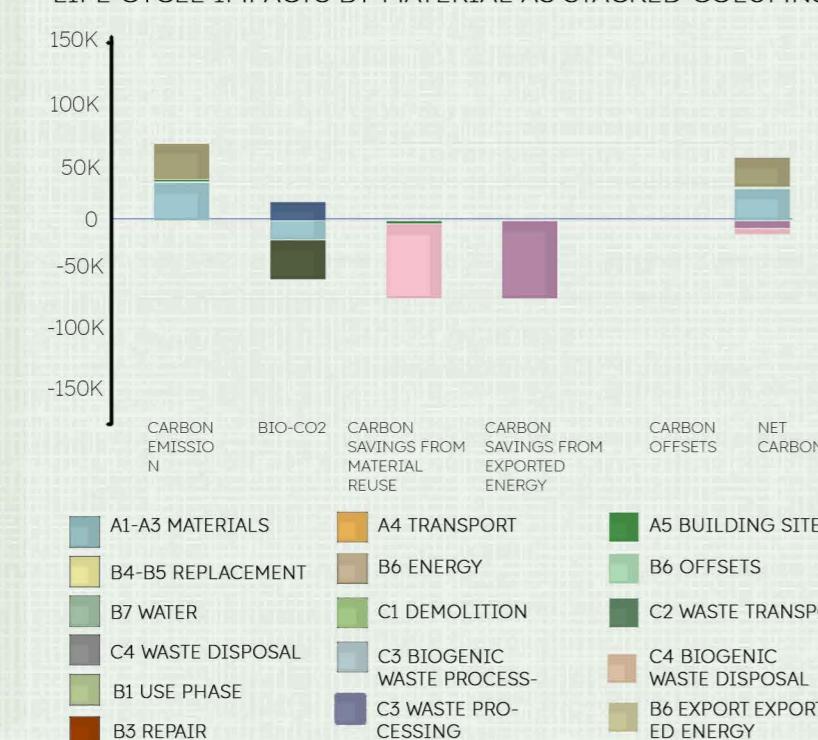
BIOGENIC CARBON (BIO - CO₂) GROUPED BY CLASSIFICATION BREAKDOWN



LIFE CYCLE IMPACTS BY MATERIAL AS STACKED COLUMNS



LIFE CYCLE IMPACTS BY MATERIAL AS STACKED COLUMNS



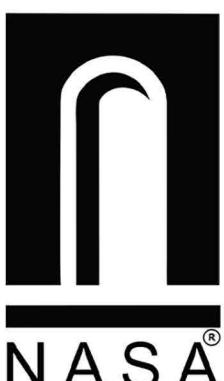
LCC : LIFE CYCLE COSTING

SR NO.	NAME	COST ₹	TRANSPORT ₹	LIFE-SPAN	INSTALLATION ₹	MAINTAINANCE ₹	ELECTRIC ₹	DISPOSAL ₹
1	VERMI-COMPOST	400,000	10,000	-	10,000	5,000	-	-
2	BIOGAS	20,00,000	15,000	20 YEARS	10,000	2,500	-	1,25,000
3	BLACKWATER	8,00,000	15,000	22 YEARS	15,000	2,000	19,500	80,000
4	SOLAR PANELS	1,50,00,000	50,000	25 YEARS	50,000	-	-	1,44,000
5	OXYGEN PLANT	1,25,00,000	15,000	-	25,000	25,000	1,25,000	90,000
6	NIGHT SOIL SEPERATOR	200,000	2,500	20 YEARS	2,500	1,000	12,000	90,000
7	FAÇADE COSTING	87,20,000	-	5 YEARS	1,50,000	75,000	5000	-
8	AIR PURIFIER	17,00,000	75,000	20 YEARS	1,00,000	15,000	5000	50,000
9	CANTILEVER SLABS	12,50,000	-	-	-	-	-	-
10	PARTITION WALLS	176,000	-	-	-	-	-	-
11	SERVICE SHAFT	2,00,000	-	-	-	-	-	-
12	THERMAL LABYRINTH	1,28,000	-	-	-	-	-	-
13	RAIN WATER	50,000	50,000	-	2,500	-	-	-

SYNERGISM TOWARDS A NET ZERO COMMUNE

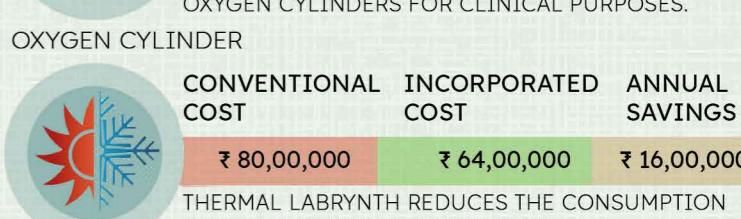
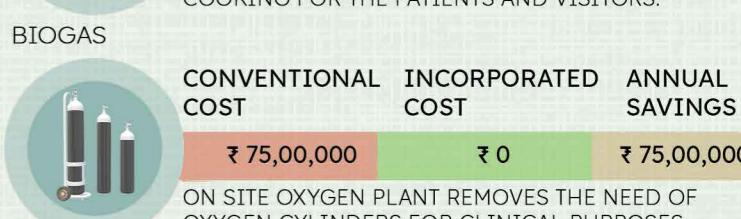
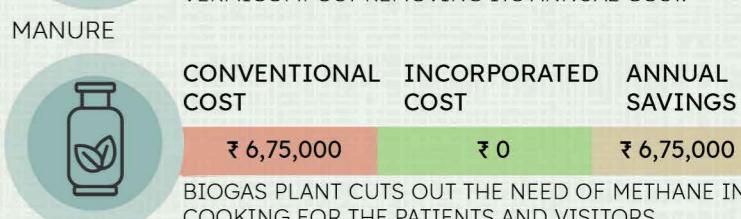
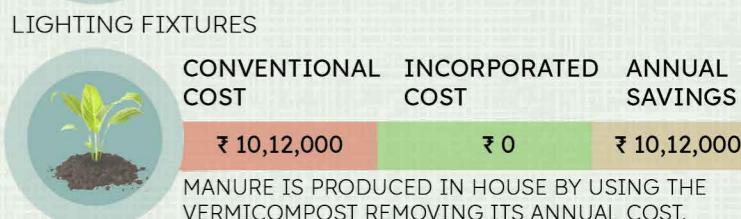
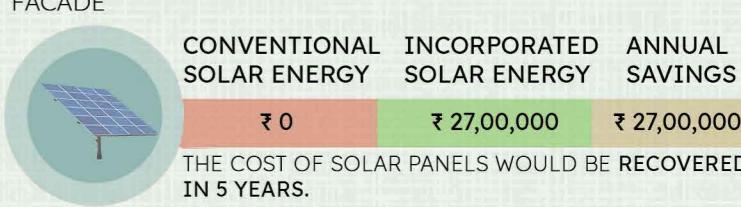
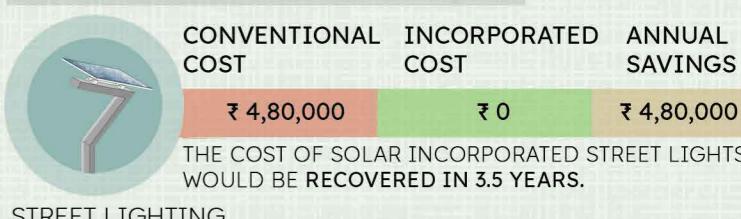
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BREAKTHROUGH AND SAVINGS

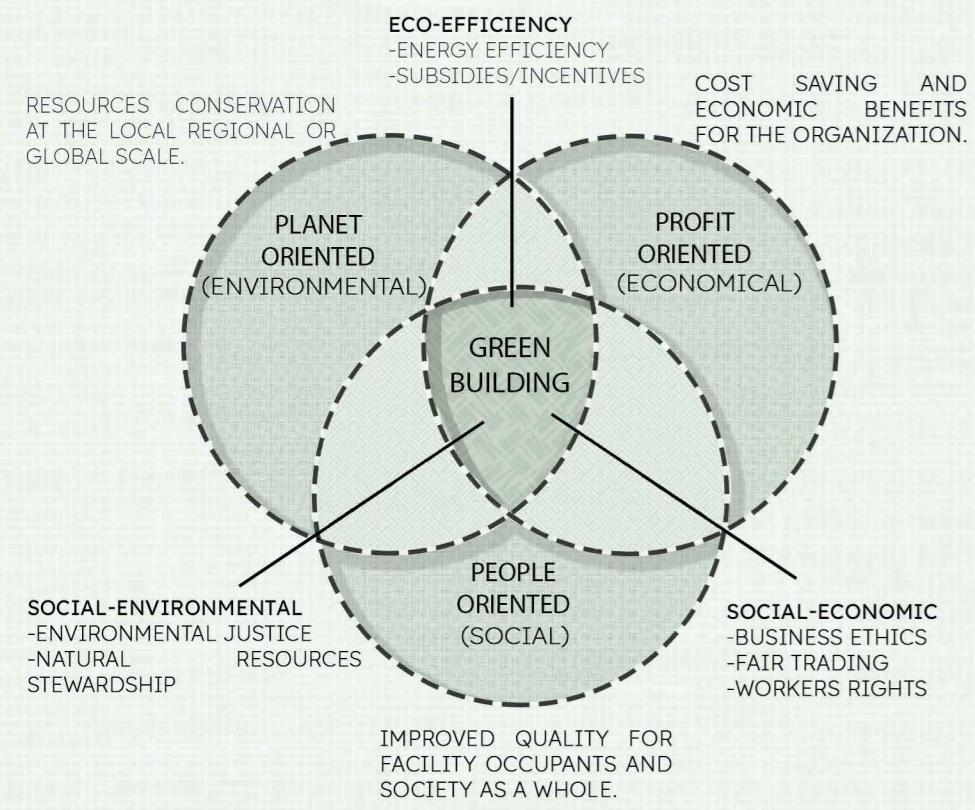


ENSURED ADAPTIVE MEASURES

PRODUCT	UTILISATION
MANURE FROM VERMICOMPOST	ECOFOREST ON GROUND FLOOR
METHANE FROM BIOGAS	COOKING PURPOSE IN KITCHEN AND CAFE
THERMAL LABYRINTH	REDUCING HVAC CONSUMPTION
SOLAR LIGHTS	POWERING CAMPUS STREET LIGHTS
HARVESTED RAIN WATER	INPUT INTO FIRE TANK FOR EMERGENCY

IMPACT ANALYSIS

GREEN BUILDINGS PROMOTE EFFICIENCY OF BUILDINGS. ENERGY OPTIMIZATION AND REDUCTION OF ENERGY CONSUMPTION CAUSES SOCIAL, ENVIRONMENTAL AND ECONOMICAL BENEFITS.



PLANET ORIENTED IMPACT-IT DECREASES WATER WASTE, AND ALSO CONTRIBUTE TO ENRICH WATER RESERVES AND ENHANCE AIR AND WATER QUALITY.

ENHANCE EXISTING ECOSYSTEMS



ECOLOGICAL ENHANCEMENT MODIFIES IMPROVES HABITAT FOR PLANTS AND ANIMALS WHILE PROTECTING HUMAN HEALTH AND THE ENVIRONMENT.

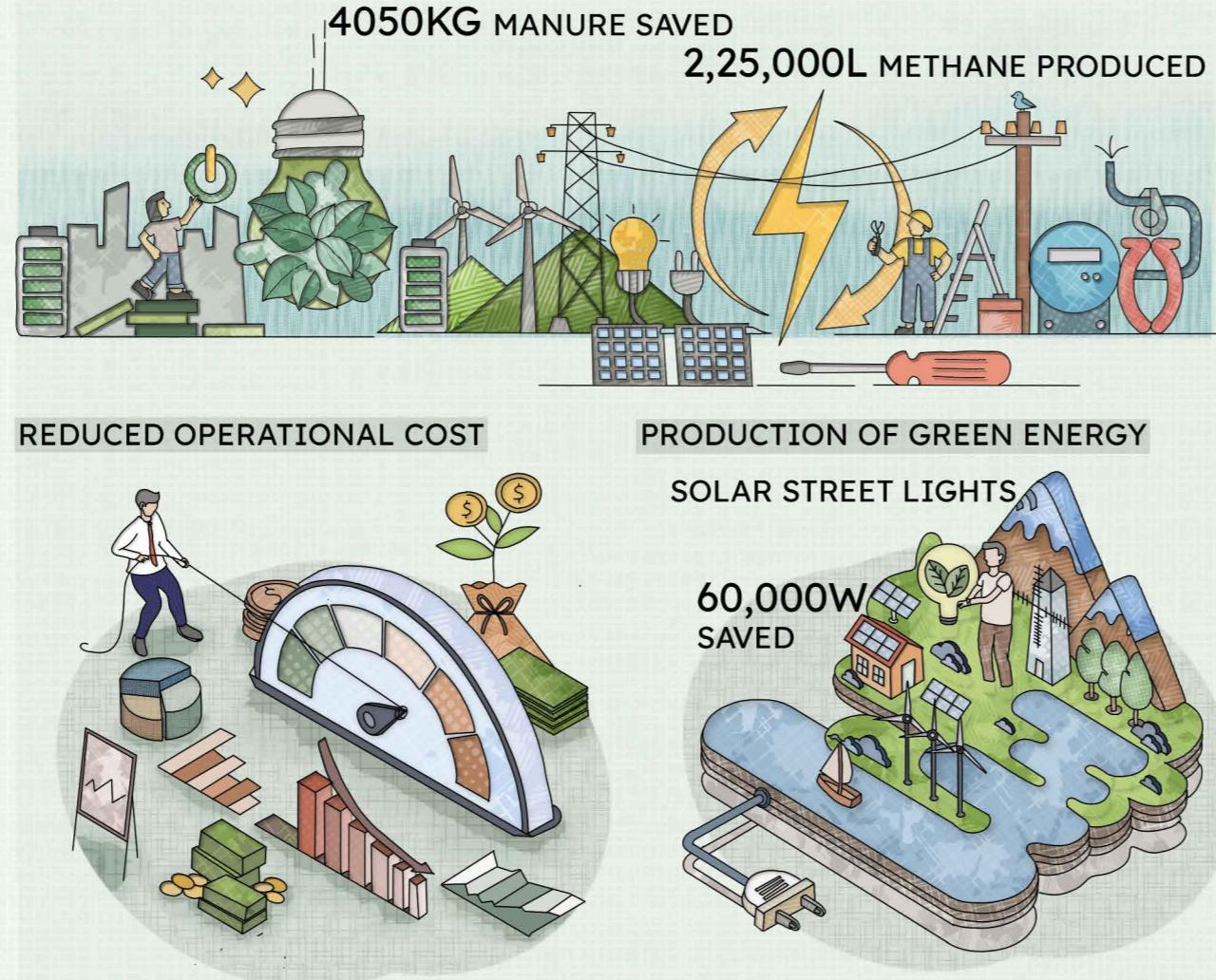
CONSERVE AND RESTORE NATURAL RESOURCES



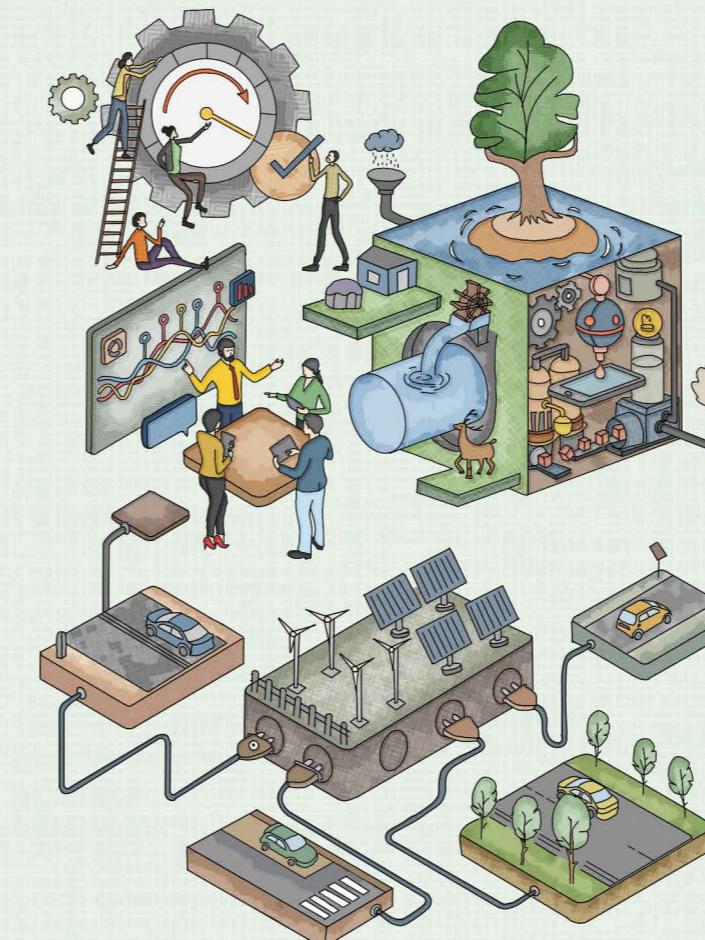
ECOSYSTEM RESTORATION IS VITAL TO CLIMATE CHANGE, POVERTY, AND BIODIVERSITY, AND THE SUSTAINABLE USE OF ECOSYSTEMS FOR OUR LIVELIHOODS AND ECONOMIES.

PROFIT ORIENTED IMPACT-GREEN BUILDINGS CAN REALIZE SIGNIFICANT SAVINGS DURING THE LIFE OF A BUILDING BY EMPLOYING NATURAL LANDSCAPING TECHNIQUES, WATER-SAVING FEATURES, LOW-MAINTENANCE MATERIALS, AND SMART BUILDING CONTROLS.

ENERGY EFFICIENT



OPTIMIZED PERFORMANCE OVER TIME



FUTURE ENVISION: PHASAL DEVELOPMENT

THE GREEN CONCEPTS AND TECHNIQUES IN THE BUILDING SECTOR CAN HELP ADDRESS ISSUES LIKE WATER EFFICIENCY, ENERGY EFFICIENCY, REDUCTION IN FOSSIL FUEL USE IN COMMUTING, HANDLING OF CONSUMER WASTE AND CONSERVING NATURAL RESOURCES MAKING FUTURE SAFE AND HABITABLE.

PRESENT DAY SCENARIO



AFTER 365 DAYS



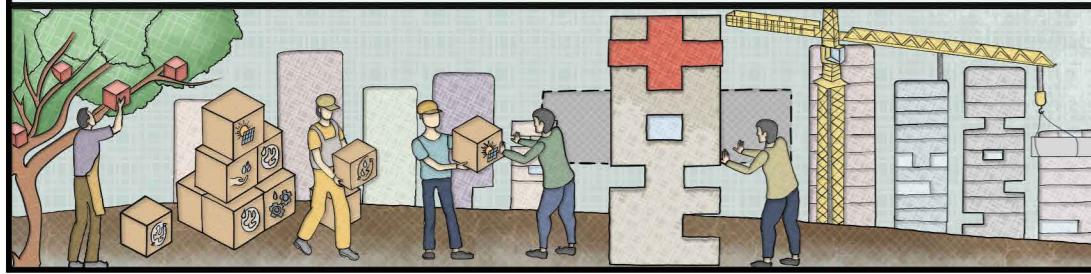
AFTER 5 YEARS



"SUSTAINABLE DEVELOPMENT IS THE PATHWAY TO THE FUTURE WE WANT FOR ALL. IT OFFERS A FRAMEWORK TO GENERATE ECONOMIC GROWTH, ACHIEVE SOCIAL JUSTICE, EXERCISE ENVIRONMENTAL STEWARDSHIP AND STRENGTHEN GOVERNANCE."

-BAN KI-MOON

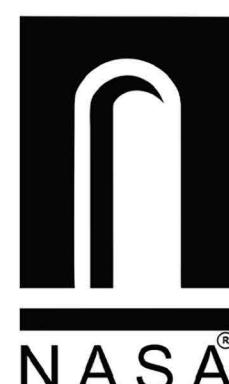
SYNERGISM TOWARDS A NET ZERO COMMUNE



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GRIHA EVALUATION CRITERION

SUSTAINABLE SITE PLANNING

- CRITERION 1: GREEN INFRASTRUCTURE
- CRITERION 2: LOW IMPACT DESIGN STRATEGIES
- CRITERION 3: DESIGN TO MITIGATE UHIE

CONSTRUCTION MANAGEMENT

- CRITERION 4: AIR AND SOIL POLLUTION CONTROL
- CRITERION 5: TOPSOIL PREVENTION
- CRITERION 6: CONSTRUCTION MANAGEMENT PRACTICES

ENERGY OPTIMIZATION

- CRITERION 7: ENERGY OPTIMISATION
- CRITERION 8: RENEWABLE ENERGY UTILIZATION
- CRITERION 9: LOW GWP AND GWP MATERIALS

OCCUPANT COMFORT

- CRITERION 10: VISUAL COMFORT
- CRITERION 11: THERMAL AND ACOUSTIC COMFORT
- CRITERION 12: INDOOR AIR QUALITY

WATER MANAGEMENT

- CRITERION 13: WATER DEMAND REDUCTION
- CRITERION 14: WASTE WATER TREATMENT
- CRITERION 15: RAINFOREST MANAGEMENT
- CRITERION 16: WATER QUALITY AND SELF-SUFFICIENCY

SOLID WASTE MANAGEMENT

- CRITERION 17: WASTE MANAGEMENT-POST OCCUPANCY
- CRITERION 18: ORGANIC WASTE TREATMENT ON-SITE

SUSTAINABLE BUILDING MATERIALS

- CRITERION 19: UTILIZATION OF ALTERNATIVE MATERIALS IN BUILDING
- CRITERION 20: REDUCTION IN GWP THROUGH LIFE CYCLE ASSESSMENT
- CRITERION 21: ALTERNATIVE MATERIALS FOR EXTERNAL SITE DEVELOPMENT

LIFE CYCLE COSTING

- CRITERION 22: LIFE CYCLE COST ANALYSIS

SOCIO-ECONOMIC STRATEGIES

- CRITERION 23: SAFETY AND SANITATION FOR CONSTRUCTION WORKERS
- CRITERION 24: UNIVERSAL ACCESSIBILITY
- CRITERION 25: DEDICATED FACILITIES FOR SERVICE STAFF
- CRITERION 26: POSITIVE SOCIAL IMPACT

PERFORMANCE METERING AND MONITORING

- CRITERION 27: PROJECT COMMISSIONING
- CRITERION 28: SMART METERING AND MONITORING
- CRITERION 29: OPERATION AND MAINTENANCE PROTOCOL

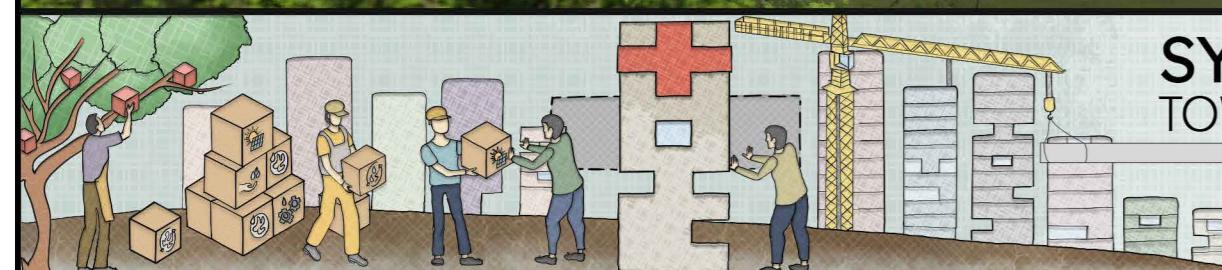
INNOVATION

- CRITERION 30: INNOVATION



LEGENDS:

- PROMOTES SUSTAINABLE COMMUNITIES
- REDUCED CARBON FOOTPRINTS
- SWITCH TO RENEWABLE RESOURCES
- GREEN TECHNOLOGY
- MINIMIZED WASTE



SYNERGISM
TOWARDS A NET ZERO COMMUNE

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Registration
code:
65GRIHA-19

GRIHA Trophy 2022-23

