THESIS REPORT ON

“VERTICAL CITY FARM (MIXED USED BUILDING)”

SECTOR 94 NOIDA

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF:

BACHELOR OF ARCHITECTURE

BY

(SIDDHARTHA PRAJAPATI)

(1160101062)

THESIS GUIDE

(AR.MOHIT SACHAN)

SESSION

2022-23

TO THE

SCHOOL OF ARCHITECTURE AND PLANNING

BABU BANARASI DAS UNIVERSITY

LUCKNOW.

SCHOOL OF ARCHITECTURE AND PLANNING

BABU BANARASI DAS UNIVERSITY, LUCKNOW (U.P.).

CERTIFICATE

I hereby recommend that the thesis entitled"VERTICAL CITY FARM, SECTOR 94 NOIDA"under the supervision, is the bonafide work of the students and can be accepted as partial fulfillment of the requirement for the degree of Bachelor's degree in architecture, school of Architecture and Planning, BBDU, Lucknow.

Prof. Mohit Kumar Agarwal Dean of Department	Prof. Sangeeta Sharma Head of Department

Recommendation Accepted

Not Accepted

External Examiner	External Examiner

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Certificate of thesis submission for evaluation

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Thanking God for his blessing who gave me courage and knowledge to complete my Thesis. I would like **to thank my Parents** who ever helped me in my whole life and **my Sister** because of them I was free from worries. With this I am thankful to my ***Guide Ar. Mohit Sachan*** who was always there for me and gave me his precious time. I would also thank to my ***Dean Prof. Mohit kumar Agarwal*** and to my ***H.O.D Prof. Sangeeta Sharma*** and **respectful teachers also my friends Adnan, Shubham, Hemant, Ritesh.**

If not for the above mentioned persons, our project would never have been completed succesefully. We one again extend our sincere thanks to them.

Thanking you

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VERTICAL CITY FARM

(MIXED USED BUILDING WITH URBAN SKY FARM).

INTRODUCTION

INSPIRED BY DR. DICKSON DESPOMMIER'S ORIGINAL CONCEPT OF "THE VERTICAL FARM", THE URBAN SKY FARM IS A VERTICAL FARM DESIGN PROPOSAL FOR A SITE LOCATED IN DOWNTOWN SEOUL WHICH MAINLY HOSTS LOCAL FOOD PRODUCTION AND DISTRIBUTION WHILE AT THE SAMETIME CONTRIBUTES TO THE IMPROVEMENT OF LOCAL ENVIRONMENTAL QUALITY THROUGH WATER, AIR FILTRATION AND RENEWABLE ENERGY PRODUCTION.

BY THE YEAR 2050, STUDIES SHOW THAT CLOSE TO 80% OF WORLD'S POPULATION WILL LIVE IN URBAN AREAS AND THE TOTAL POPULATION OF THE WORLD WILL INCREASE BY 3 BILLION PEOPLE. INITIATED BY DR. DICKSON DESPOMMIER'S CONCEPT OF "THE VERTICAL FARM", URBAN SKYFARM PROPOSES A WAY TO RESOLVE FUTURE PROBLEMS SUCH AS LAND SHORTAGE, DEFORESTATION AND ENVIRONMENTAL POLLUTION FOLLOWED BY OVER POPULATION. BY UTILIZING HYDROPONIC SYSTEMS AS SUBSTITUTION OF SOIL BASED AGRICULTURAL EXTENSIONS, VERTICAL FARMS CAN PRODUCE FOOD MORE EFFICIENTLY AND HEALTHILY WITH SUPPLEMENTARY HEATING, LIGHTING AND MOISTURIZING WITHIN A CONTROLLED.

AIM AND OBJECTIVES

VERTICAL FARM IN ANY BUILDING YOU CAN GROW FOOD INSIDE OF IT WHICH IS TALLER THAN A SINGLE STORY. MOREOVER, VERTICAL FARMING COULD BE CULTIVATED PLANT LIFT WITH IN A GRENHOUSE OR ON VERTICALLY IN CLINED SURFACES OR EVEN IN A HIGH-RIISE BUILDING. THE IDEA OF VERTICAL FARMING UESE TECHNIQUES SIMILAR TO BOTH TRADITIONAL FARMING AND GLASS HOUSES, WHERE NATURAL SUNLIGHT CAN BE AMPLIFIED WITH ARTIFICAL LIGHTING.

POTENTIAL ON LARGE SCALE

1. SUPPLY ENOUGH FOOD IN A SUSTAINABLE FASHION TO COMFORTABLY FEED ALL OF HUMANKIND FPRTHE FORESEEABLE FUTURE.
2. ALLOW LARGE TRACTS OF LAND TO REVERT TO THE NATURAL LAND SCAPE RESTORING ECOSYSTEM FUNCTIONS AND SERVICES.
3. SAFELY AND EFFICIENTLY USE THE ORGANIC PORTION OF HUMAN AND AGRICULTURE WASTE TO PRODUCE ENERGY THROUGH METHANE GENERATION AND AT THE SAME TIME SIGNIFICANTLY REDUCES POPULATIONS OF VERMIN (E.G; RATS, COCKROACHES).
4. TAKE ADVANTAGES OF ABANDONED AND UNUSED URBAN SPACES.
5. ALLOW YEAR ROUND FOOD PRODUCTION WITHOUT LOSS OF YIELD DUE TO CLIMATE CHANGES OR WEATHER RELATED EVENTS.

SCOPE

TODAY, CURRENT GREENHOUSE PRODUCERS BENEFIT FROM THE ELIMINATION OF EXTERNAL MATURAL PROCESSES, SUCH AS DROUGHT, FLOOD, AND PESTS, AS CONFOUND ING ELEMENTS TO FOOD PRODUCTION. CURENTLY, GREENHOUSES ARE USED COMMERCIALLY TO GROW SUCH AS TOMATOES, PEPPERS, CUCUMBERS, LETTUCE, ALONG WITH VARIOUS VEGETABLES, SUCH AS STRAWBERRIES, AND HERBS SUCH AS BASIL, SAGE AND ROSEMARY. WORLWIDE, GREENHOUSE VEGETA BLES PRODUCTION IS LED BY SPAIN, THE NETHERLANDS, MEXICO, CANADA AND UNITED STATESPRODUCTION AREAS IN HECTARES (HA) INCLUDE: SPAIN (70000 HA), THE NETHERLANDS (4300HA), MEXIC0 (1520HA), CANADA (876HA), AND THE U.S. (395HA). BY APPLYING THESE IDEAS IN MY OWN DESIGN IHAVE TO DEVELOPE MIXED USE FARMING COMPLEX WITH MAXIMUM FACILITIES AND THUS PROMOTING URBAN AGRICULTURE AND SUSTAINABILITY TO FEED THE FUTURE POPULATION OF THE URBAN CORE. IT IS BASICALLY AN AGRICULTURE TECHNIQUE THAT INVOLVES LARGE SCALE AND STACKED, INDOOR ARGRICULTURE IN OPEN URBAN AREAS. VERTICAL FARMS, MANY STORIES HIGH, WILL BE SITUATED IN THE HEART OF THE WORLD'S URBAN CENTERS. IF SUCCESSFULLY IMPLEMENTED, THEY OFFERTHE PROMISE OF URBAN RENEWAL, SUSTAINABLE PRODUCTION OF A SAFE AND VARIED FOOD SUPPLY (YEAR ROUND CROP PRODUCTION), AND THE EVENTUAL REPAIR OF ECOSYSTEM THAT HAVE BEEN SACRIFIED FOR HORIZONTAL FARMING.

BENEFITS

THE MAIN ADVANTAGES ARE:

1. MAXIMUM CROP PRODUCTION ANUALLY.
2. IT IS ESTIMATED THAT 1ACRE OF VERTICAL FARM COULD BE EQUALS TO 10-20 TRADITIONAL SOIL-BASED ACRES.
3. GROWING FOOD CLOSE TO HOME WILL LOWER THE AMOUNT OF FOSSIL FUELS NEEDED TO DELIVER THEM. ELIMINATE FOR EVER THE NEED OF FOSSIL FUEL.
4. DURING THE ACT OF FARMING (I.E; APPLYING FERTILIZERS, SEEDING, WEEDING, HARVESTING).

Commercial Crops	Experimental crops
•Tomatoes	•Bok choi
• Cucumbers	• Spinach
• Lettuce	• Chinese Cabbage
• Peppers	• Mustard greens
• Strawberries	• Upland cress
• Herbs	• Wheat
• Raspberries	• Corn
• Tobacco	• Rice
	• Sugar cane
	• Sugar beets

WASTE MANAGEMENT SUB SYSTEM

IN THE PROCESS OF PRODUCING EDIBLE BIOMASS, THE VERTICAL FARM GENERATES BIO-WASTE AS BY PRODUCTS (E.G. LEAVES, STEM, FIBROUS ROOT, DAMAGED FRUIT AND VEGETABLES).

FOOD PROCESSING SUB-SYSTEM

WHEN PLANTS ARE FULLY GROWN THEY NEED TO BE HARVESTED AND READIED FOR DELIVERY TO SUPERMARKETS AND RESTAURANTS.THIS IS DONE ON THE FOOD PROCESSING FLOOR. IN THE PROCESS CONCEIVED ABOVE ONE MAY PRODUCED A KG OF BIO-MASS WITHTHE COMPOSITION.

WASTE MANAGEMENT AND SUSTAINABILITIES.

SOLID WASTE CAN BE RECYCLED (RETURNABLE CANS, BOTTLES, CARDBOARD PACKAGES, ETC.) AND/OR USED IN ENERGY GENERATING SCHEMES WITH TECHNOLOGIES THAT ARE CURRENTLY IN USE. A MAJOR SOURCE OF ORGANIC WASTE COMES FROM THE RESTAURANT INDUSTRY. METHANE GENERATED FROM THIS SINGLE RESOURCE COULD CONTRIBUTE SIGNIFICANTLY TO ENERGY GENERATION, AND MAY BEABLETO SUPPLY ENOUGH TO RUN VERTICAL FARMS WITHOUT THE USE OF ELECTICITY FROM THE GRID, FOR EXAMPLE, IN NEW YORK CITY THERE ARE MORE HAN 21000 FOOD SERVICE ESTABLISHMENT. ALL OF WHICH PRODUCE SIGNIFICANT QUANTITES OF ORGANIC WASTE, AND THEY HAVE TO PAY TO HAVE CITY CART IT OFF.

TECHNOLOGIES AND BUILDING SERVICES

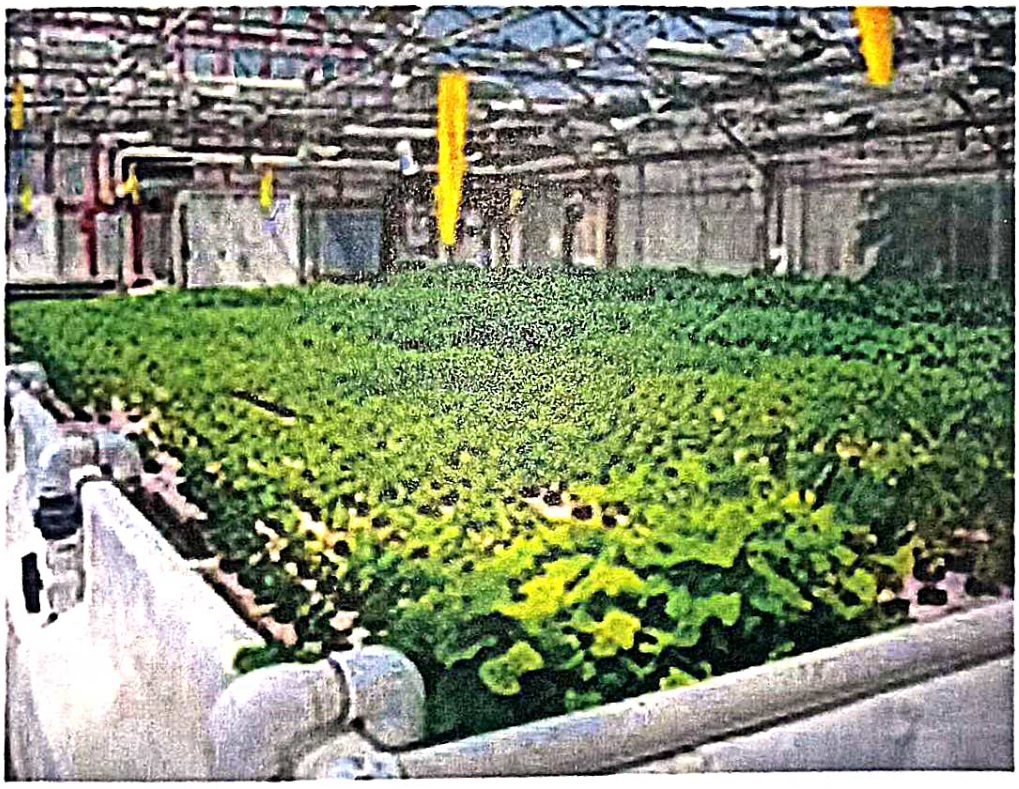
1. HYDROPONICES SYSTEM.
2. AEROPONICS SYSTEM.
3. LIGHTING.
4. HEATING AND AIR CONDITIONING.
5. DEHUMIDIFICATION SYSTEM. VENTILLATION SYSTEM.

HYDROPONICES SYSTEM. (STATIC SOLUTION CULTURE).
THE DEEP WATER RAFT TANK AT THE CROP DIVERSIFICATION CENTRE (CDC) SOUTH AQUAPONICS GREENHOUSE IN BROOKS, ALBERTA.

IN STATIC SOLUTION CULTURE, PLANTS ARE GROWN IN CONTAINERS OF NUTRIENT SOLUTION, SUCH AS GLASS MASON JARS (TYPICALLY, IN-HOME APPLICATIONS),

PLASTIC BUCKETS, TUBS, OR TANKS .THE SOLUTION IS USUALLY GENTLY AERATED BUT MAY BE UN-AERATED. IF UN-AERATED, THE SOLUTION LEVEL IS KEPT LOW ENOUGHTHAT ENOUGH ROOTS ARE ABOVE THE SOLUTION SO THEY GET ADEQUATE OXYGEN.A HOLE IS CUT IN THE LID OF THE RESERVOIR FOR EACH PLANT.A SINGLE RESERVOIR CAN BE DEDICATED TO A SINGLE PLANT, OR TO VARIOUS PLANTS. RESERVOIR SIZE CAN BE INCREASED AS PLANT SIZE INCREASES.

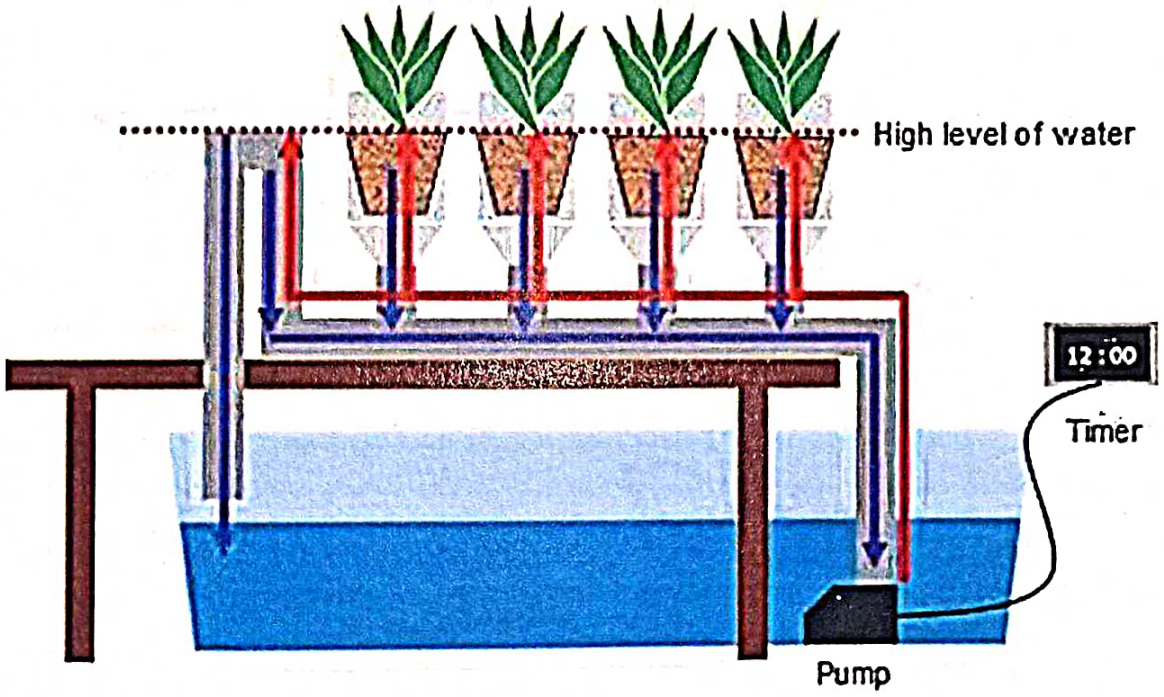
RESERVOIR SYSTEM

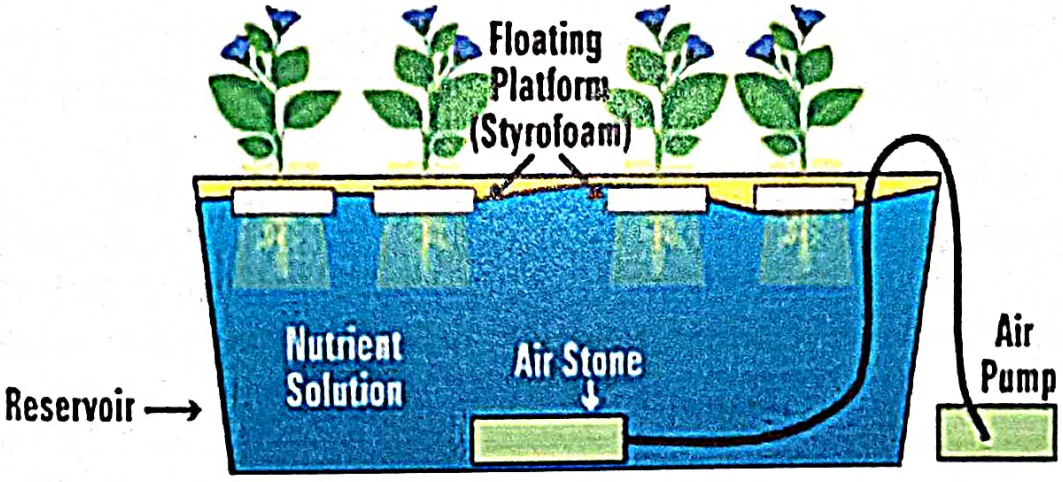


HYDROPONICES SYSTEM.
(CONTINUOUS-FLOW SOLUTION).

IN CONTINUOUS-FLOW SOLUTION CULTURE, THE NUTRIENT SOLUTION CONSTANTLY FLOWS PAST THE ROOTS. IT IS MUCH EASIER TO AUTOMATE THAN THE STATIC SOLUTION CULTURE BECAUSE SAMPLING AND ADJUSTMENTS TO THE TEMPERATURE AND NUTRIENT CONCENTRATIONS CAN BE MADE IN A LARGE STORAGE TANK THAT HAS POTENTIAL TO SERVE THOUSANDS OF PLANTS.

HYDROPONICES SYSTEM.





ADVANTAGES OF HYDROPONIC

1. FEWER PESTS & DISEASES
2. NO WEEDS
3. BETTER GROWTH RATE
4. EFFECTIVE USE OF NUTRIENTS
5. HYDROPONICS IS WATER-SAVING

6. CLIMATE CONTROL
7. MAKE BETTER USE OF SPACE AND LOCATION
8. NO SOILS NEEDED.
10. LESS USE OF INSECTICIDE, AND HERBICIDES
11. LABOUR AND TIME SAVERS
12. HYDROPONICS IS A STRESS-RELIEVING HOBBY.

DISADVANTAGES

1. A HYDROPONIC GARDEN REQUIRES YOUR TIME AND COMMITMENT
2. EXPERIENCES AND TECHNICAL KNOWLEDGE
3. ORGANIC DEBATES
4. WATER AND ELECTRICITY RISKS
5. SYSTEM FAILURE THREATS
6. INITIAL EXPENSES
7. LONG RETURN PER INVESTMENT
8. DISEASES & PESTS MAY SPREAD QUICKLY

LIGHTING SERVICE

ONLY 37% OF THE ENERGY IN SUNLIGHT IS WITHIN THE WAVE LENGTH (COLOURS) USEFUL FOR PHOTOSYNTHESIS, WHILE 62.4% IS INFRARED (THERMAL ENERGY) AND THE REMANING 0.6% IS ULTRAVIOLET. PHOTOSYNTHESIS IN THE PLANT LEAF IS POWERED BY 1% OF THE SUNLIGHT THAT FALLS ON THE PLANT, 10% OF THE SUNLIGHT IS REFLECTED AND 10% PASSES THROUGH THE LEAF. THE LEAF WILL RETAIN 80% WHICH IS USED FOR TRANSPIRATION. SOME OF THE LIGHTS IS RE-RADIATED, WHILE THE FRACTION THAT REMAINS IS USED FOR BUILDING FOOD FROM THE CARBON DIOXIDE, MINERALS AND WATER.USEABLE LIGHT ENERGY FOR PLANT GROETH IS MEASURED IN MICRO-EINSTEIN'S THE SUNLIGHT REACHING OUR PLANT IS APPROXIMATELY 2200 MICRO-EINSTEIN ON A CLOUD-FEWER DAYS AND 170 MICRO-EINSTEIN ON A VERY CLOUDY DAY. FOR INDOOR FROWING UNDER ARTIFICAL LIGHTING ARAGE OF 200 TO 500 MICRO-EINSTEIN IS CONSIDERED BY EXPERTS AT NASA TO BE MINIMAL ENERGY LEVEL FOR PLANT GROWTH.

CRITERIA FOR MAXIMIZINGTHE ARTIFICAL LIGHT ENERGY FOR PHOTOSYNTHESIS.

THE INDOOR GROWER HAS SEVERAL OPTIONS FOR MAXIMIZING THE ARTIFICAL LIGHT ENERGY FOR PHOTOSYNTHESIS, THEY ARE AS FOLLOWS:

1. USE LIGHT BULBS THAT HAVE THE HIGHEST LEVEL MICRO-EINSTEIN PER WATT (REPRODUCING NATURAL SUNLIGHT CONDITION AS MUCH AS POSSIBLE) PLACE THE BULB AS CLOSE TO THE PLANT AS POSSIBLE TO DELIVER THE HIGHEST LEVEL MICRO-EINSTEIN PER SQUARE INCH (WITHOUT OVERHEATING THE PLANT) FILTER OUT INFRA-RED RADITION (TO USE ONLY THE PORTION OF THE LIGHT SPECTRUM NEEDED BY THE PLANT AND TO REDUCE HEAT BUID-UP INSIDE OF THE PLANT CELL.)

TEMPERATURE & PLANT GROWTH

EACH AND EVEY PLANT HAS DIFFERENT REQUIREMENT WITH REGARDS TO TEMPERATURE. TEMPERATURE VARIES FROM 50-100 DEGREE F. SOME EXAMPLES:

1. MUSHROOMS: 50-80 F.
2. STRAWBERRY: 35-65 F.
3. TOMATO: 40-90 F.
4. POTATOES: 50-100 F.
5. GRAINS: 50-100 F.
6. FLOWERS: 35-70 F.

1st day

4th day

7th day

HUMIDITY & PLANT GROWTH

THE IDEAL HUMIDITY RANGE FOR HEALTHY PLANT GROWTH IS 50% HUMIDITY, PLUS OR MINUS 10%. THE HIGHER RH PERCENTAGES, THE STOMATA HAVE PROBLEMS GETTING RID OD EXCESS WATER. AT A LOWER RH, THE STOMA KEEP RELEASING WATER UNTIL THE PLANT DRIES OUT .AT THAT MOMENT, THE STOMATA CLOSE. THEN THE INTAKE OF CARBON DIOXIDE STAGNATES, AND PLANT GROWTH IS IMPAIRED.

AIR CONDITIONING SYSTEM

HEATING SYSTEM GENERALLY USED IN COLD COUNTRIES, NOT APPLICABLE FOR INDIAN CONDITIONS. BY USING THEN A TEMPERATURE OF 70 DEGREE CAN BE MAINTAINED WHEN THE OUTSIDE TEMPERATURE IS0 DEGREES.

NATURAL COOLING

1. ROOF VENT OPENS TO ALLOW HOT AIR TO ESCAPE TO OUTSIDE.
2. DOOR OR OTHER OPENING MUST BE LEFT OPEN TO PROVIDE FOR INCOMING AIR FROM OUTSIDE TO REPLACE EXHAUSTED AIR.
3. ON HOT SUMMER DAYS TEMPERATURES CAN RISE 20 TO 30 DEGREES ABOVE OUTSIDE TEMPERATURE.

WARM GROUP VEGGIES

Cucumber

Wheat

Ladies finger

Capsicum

Pointed gourd

COLD-WARM GROUP VEGGIES

Tomatoes

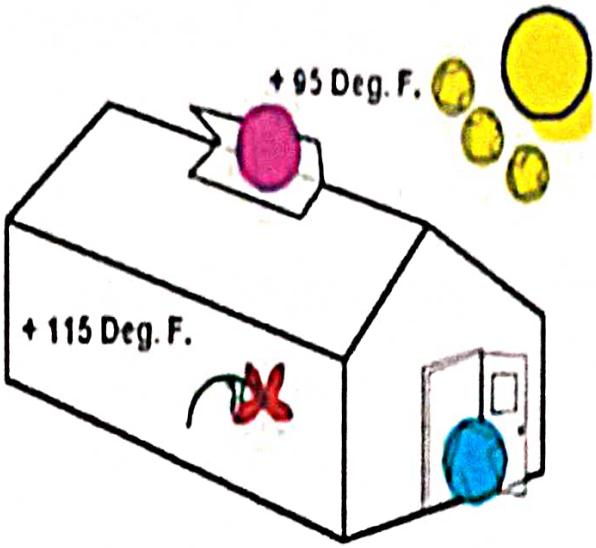
Carrot

Broccoli

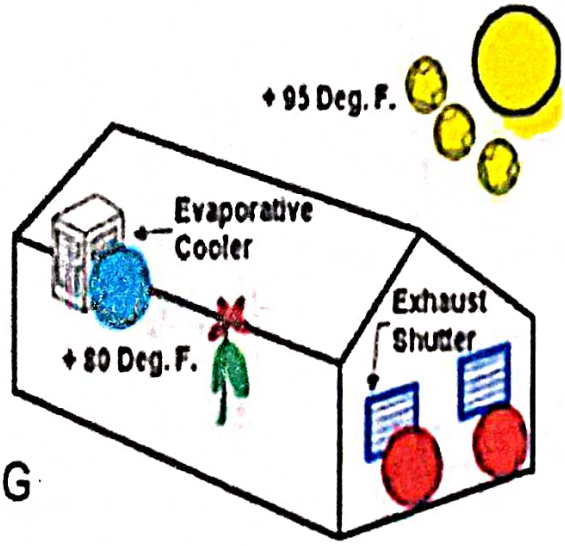
Cabbage

EVOPORATIVE COOLING

1. OUTDOOR AIR IS COOLED BY EVAPORATIVE COOLER (LOCATED OUTSIDE) AND DISCHARGE INTO GREEN HOUSE.
2. HOT AIR IS EXHAUSTED THROUGH OUTLET SHUTTERS WHICH OPERATE AUTOMATICALLY ON PRESSURE DIFFERENTIAL.
3. TEMPERATURE INSIDE HOUSE CAN BE AS MUCH AS 10 TO 15 DEGREES COOLER THAN OUTDOOR TEMPERATURE WITH PROPERLY DESIGNED SYSTEM.
4. EVAPORATIVE COOLER IS CONTROLLED BY THERMOSTAT.
5. SYSTEM EFFICIENCY CAB BE INCREASED WITH THE USE OF SHADE SYSTEM. THE FANS WILL NOT HAVE TO WORK AS HARD TO MAINTAIN THE DESIRE TEMPERATURE.



NATURAL COOLING



EVAPORATIVE COOLING

SITE ANALYSIS

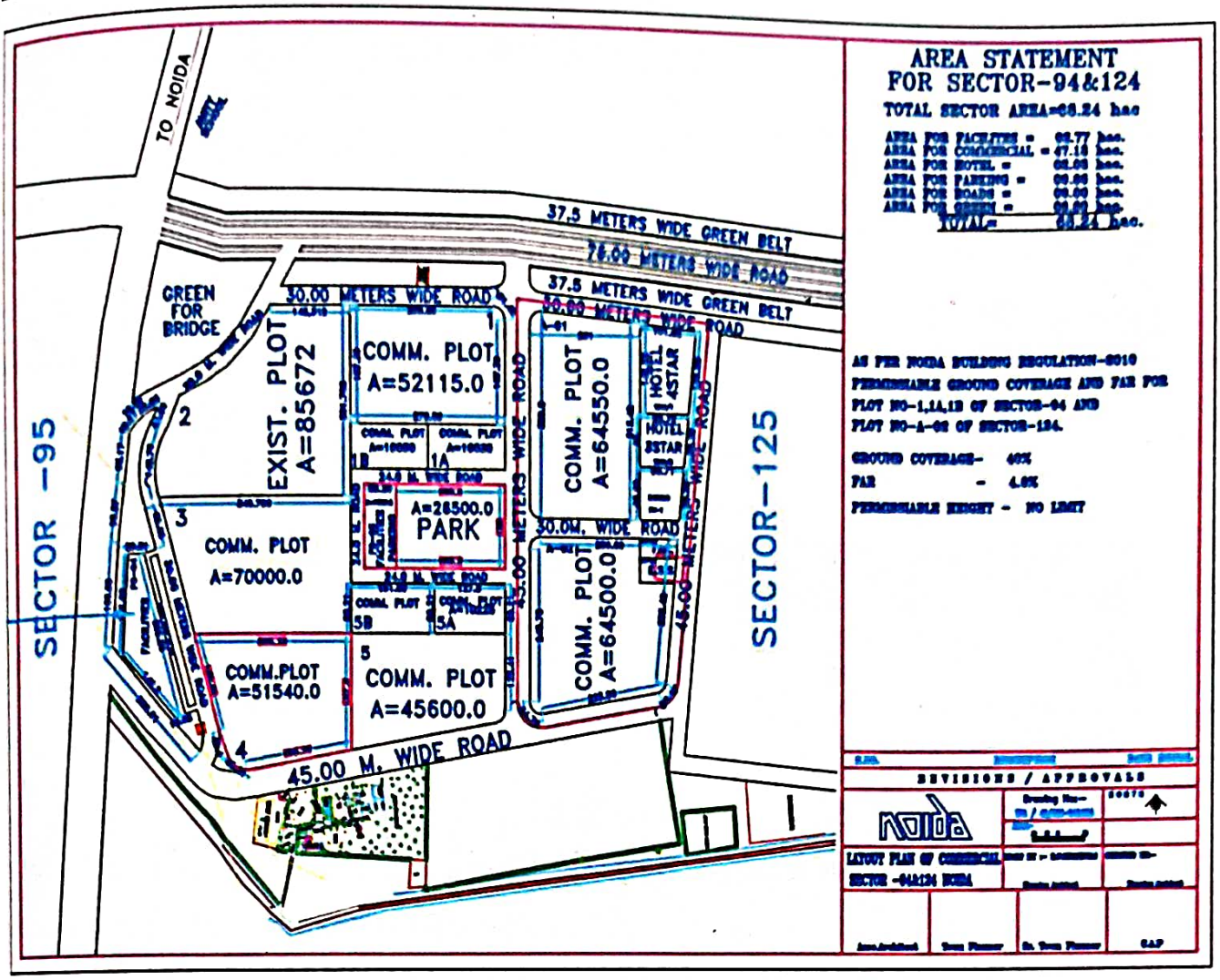
LOCATION

SITE IS LOCATED IN SECTOR 94.

SITE INFORMATION

1. LOCATION: SECTOR 94, NOIDA
UTTAR PRADESH.
2. SITE TOPOGRAPHY: LEVELLED PLAIN LAND.
3. SITE AREA: 12.7 ARCES.
4. PERMISSABLE GROUND COVERAGE: 40%.
5. F.A.R: 4.0
6. HEIGHT RESTRICTION: NO LIMIT.
7. LAND USE: COMMERCIAL LAND USES NORMS APPLICABLE AS PER NOIDA DEVELOPEMENT AUTHORITY AND MASTER PLAN NOIDA.

SITE DIMENSION



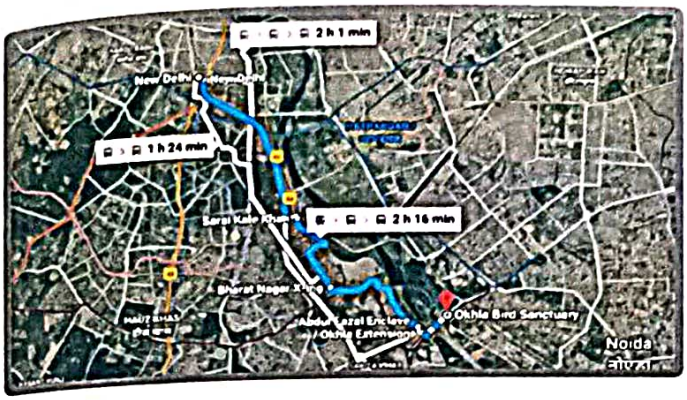
APPROACH TO SITE

FROM LUCKNOW:

1. VIA TRAIN FROM (CHARBAGH RAILWAY STATION).
2. VIA BUS FROM (CHARBAGH BUS STAND).
3. VIA AIRPLAN FROM (CHAUDHARY CHARAN SINGH AIRPORT).

VIA TRAIN FROM (CHARBAGH RAILWAY STATION).

1. FROM CHARBAGH RAILWAY STATION TO NDLS.
   (A) NEAREST METRO STATION FROM NDLS IS NEW DELHI METRO STATION AT A DISTANCE OF APPROX. 150M IT TAKES 2MIN.FROM NEW DELHI METRO STATION TO OKHLA BIRD SCANTUARY METRO STATION IT TAKES APPROX. 1HR 24MIN.
   (B) FROM NDLS TO SECTOR 94 IT TAKES APPROX .18.2KM IT TAKES 30MIN.



VIA BUS FROM (CHARBAGH BUS STAND)

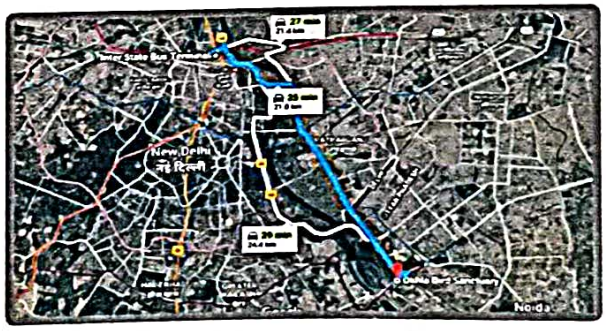
1. CHARBAGH TO ISBT 528KM------7HRS 4MIN.
2. CHARBAGH TO NOIDA BUS STANDS 515KM-----6HRS 50MIN.

FROM ISBT TO SECTOR 94

1. FROM ISBT NEAREST METRO STATION IS KASHMERE GATE METRO STATION WHICH IS AT A WALKING DISTANCE 200M IT TAKES 2MIN.

(A) FROM KASHMERE GATE METRO STATION TO SECTOR 94 IT TAKES 1HR 30MIN APPROX.

(B) FROM ISBT TO SECTOR 94 VIA ROAD IS APPROX. 21KM IT TAKES 25MIN APPROX.(VIA NOIDA LINK RD).



FROM NOIDA BUS STAND TO SECTOR 94

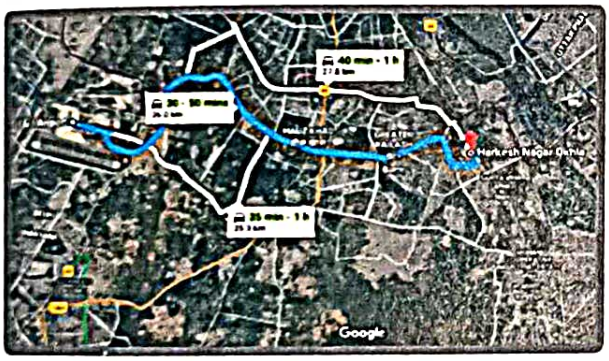
(A) FROM NOIDA BUS STAND TO SECTOR 94 IS APPROX 5.2KM AND IT TAKES APPROX 8 MIN BY ROAD.

VIA AIRPLAN FROM (CHAUDHARY CHARAN SINGH TO I.G.I AIRPORT)

1. I.G.I AIR PORT TO SECTOR 94(VIA METRO).
2. I.G.I AIR PORT TO SECTOR 94(VIA ROAD).

(A) FROM I.G.I AIR PORT NEAREST METRO STATION IS INFRONT OF TERMINAL 3 THAN FROM METRO STATION TO OKHLA BIRD SCANTUARY AT SECTOR 94 IT TAKES APPROX. 1HR 25MIN.

(B) FROM I.G.I AIR PORT TO SECTOR 94 (VIA ROAD) IS ABOUT 30KM APPROX. AND IT TAKES ABOUT 44MIN (VIA OUTER RING ROAD).

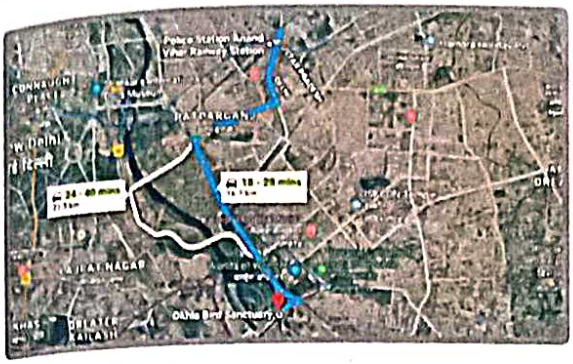


VIA TRAIN FROM (CHARBAGH RAILWAY STATION).

1. FROM CHARBAGH RAILWAY STATION TO ANVT.

(A) NEAREST METRO STATION FROM ANVT AT A DISTANCE OF APPROX. 650M IT TAKES 7MIN.FROM NEW METRO STATION TO OKHLA BIRD SCANTUARY METRO STATION IT TAKES APPROX. 1HR 24MIN.

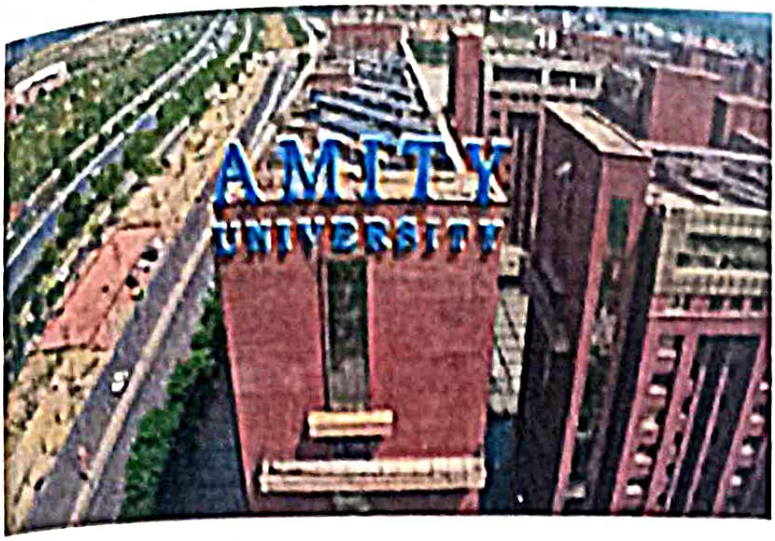
(B) FROM NDLS TO SECTOR 94 (VIA ROAD) IS APPROX .16.7KM IT TAKES 30MIN.



PROXIMITY AND LANDMARKS

SITE IS APPROXIMATELY 4.5KM FROM BOTANICAL GARDEN METRO STATION AND THE DISTANCE CAN BE COVERED BY BUS, AUTO OR CAB EASILY AND CONVINIENTLY.

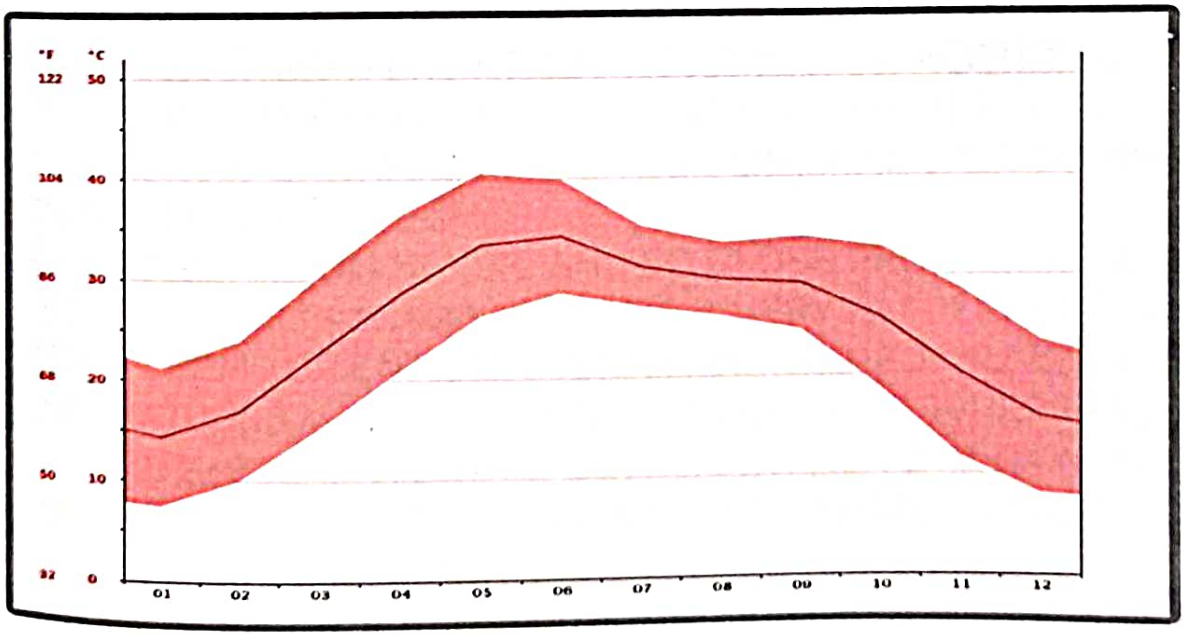
A NEW YET VERY IMPORTANT METRO STATION HAS BEEN RECENTLY OPENED FOR PUBLIC WHICH IS ON A WALKING DISTANCE FROM THE SITE THE STATION HAS BEEN NAMED AS SUPERNOVA OKHLA BIRD SANCTUARY STATION.



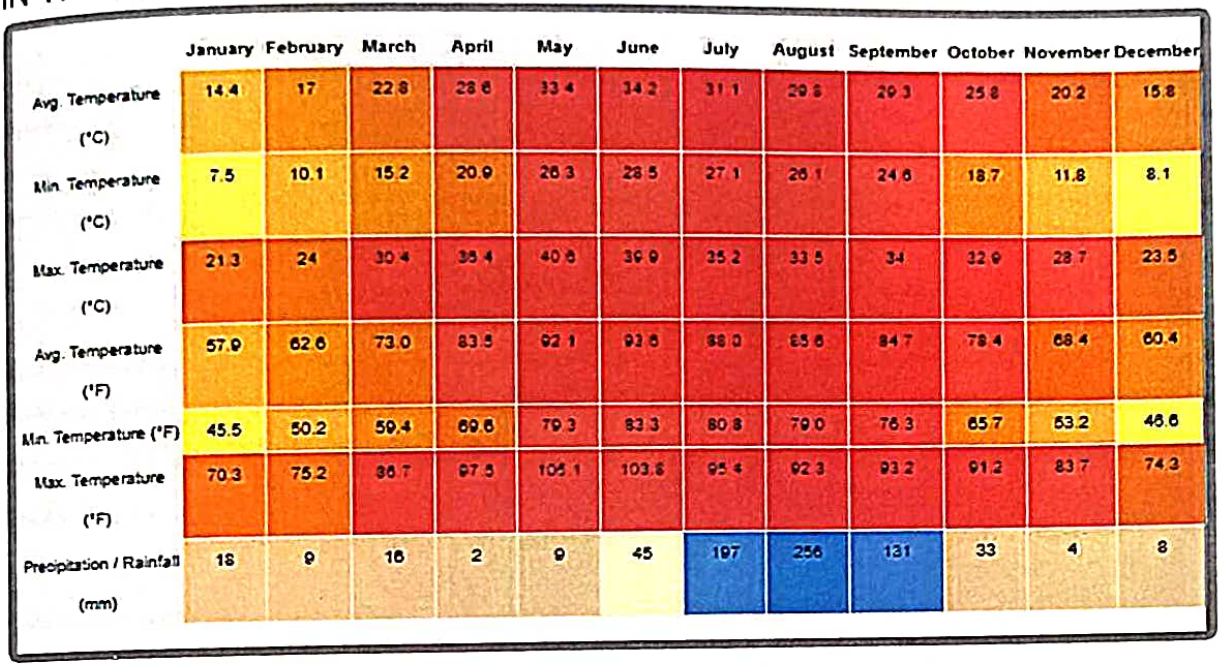
SITE IS APPROXIMATELY 3KMS FROM, AMITY UNIVERSITY AND TAKES AROUND 10MIN. IN A USUAL TRAFFIC.

IT'S ABOUT 5KMS FROM DNDN ENTRING ONTO NOIDA-GR. NOIDA EXPRESSWAY.

TEMPERATURE AND SUNPATH



GRAPH SHOWS AVERAGE TEMPERATURE IN °C AND °F.
JUNE IS THE WARMEST MONTH OF THE YEAR.THE TEMPERATURE IN JUNE AVERAGES 32.2 °C.IN JANUARY, THE AVERAGE TEMPERATURE IS 14.4 °C.THE LOWEST AVERAGE TEMPERATURE IN THE WHOLE YEAR.

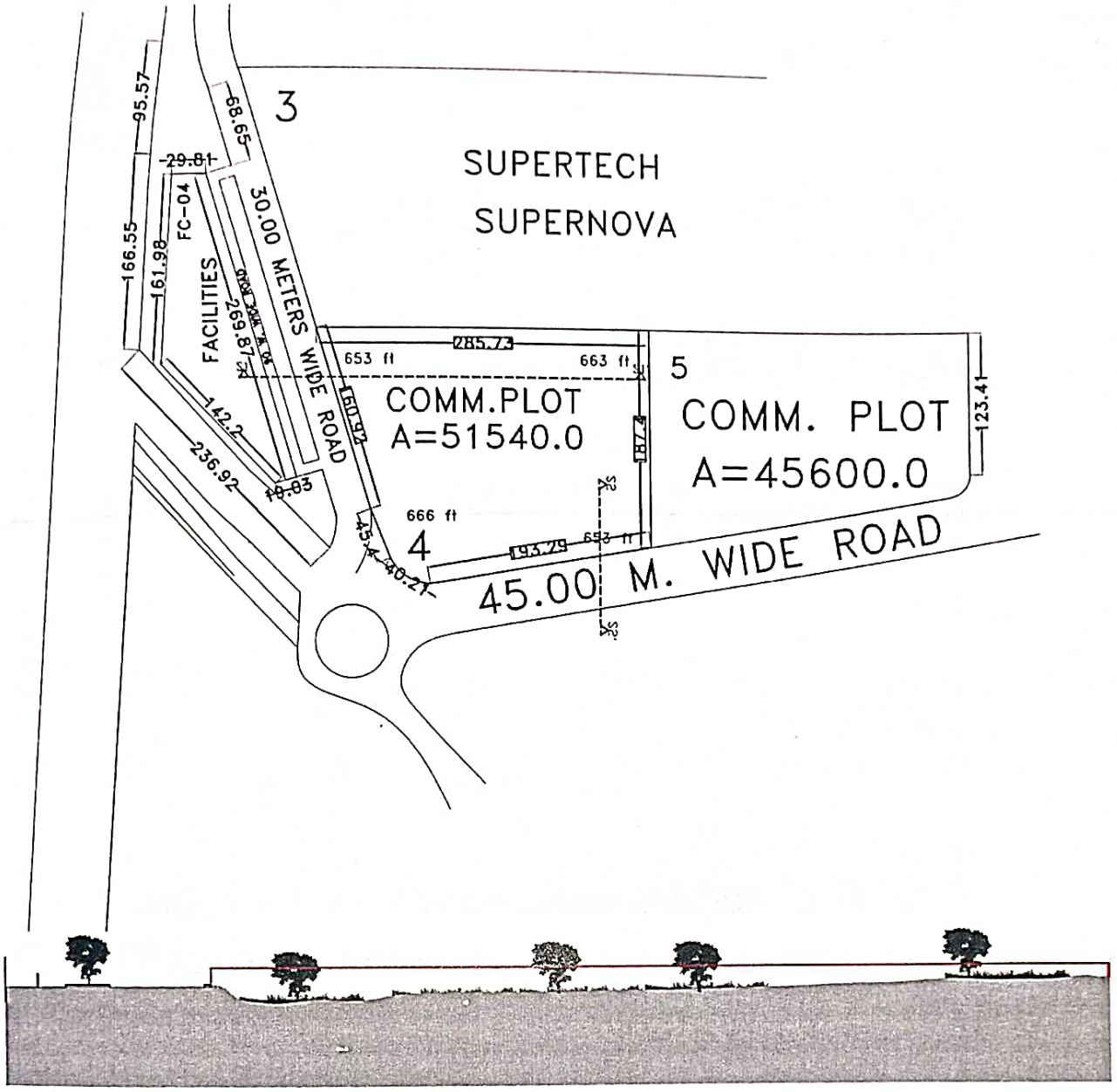


	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	14.4	17	22.8	28.6	33.4	34.2	31.1	29.8	29.3	25.8	20.2	15.8
Min. Temperature (°C)	7.5	10.1	15.2	20.9	26.3	28.5	27.1	26.1	24.6	18.7	11.8	8.1
Max. Temperature (°C)	21.3	24	30.4	36.4	40.6	39.9	35.2	33.5	34	32.9	28.7	23.5
Avg. Temperature (°F)	57.9	62.6	73.0	83.5	92.1	93.6	88.0	85.6	84.7	78.4	68.4	60.4
Min. Temperature (°F)	45.5	50.2	59.4	69.6	79.3	83.3	80.8	79.0	76.3	65.7	53.2	46.6
Max. Temperature (°F)	70.3	75.2	86.7	97.5	105.1	103.6	95.4	92.3	93.2	91.2	83.7	74.3
Precipitation / Rainfall (mm)	18	9	16	2	9	45	197	256	131	33	4	8

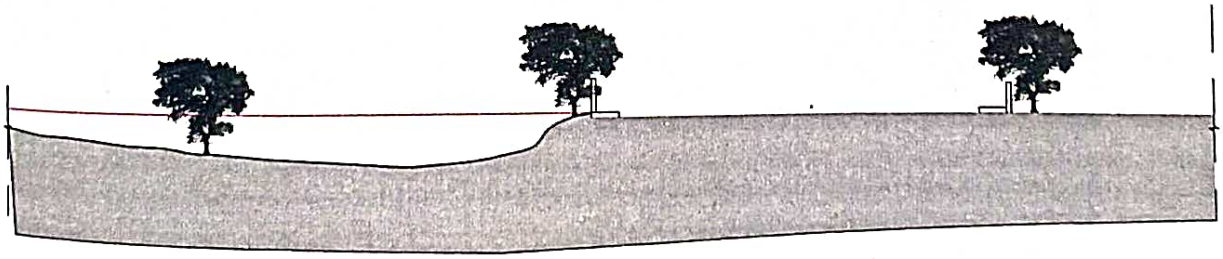
CHART SHOWS AVERAGE TEMPERATURE IN °C AND °F AND PRECIPITATION & RAINFALL IN MM.
THERE IS A DIFFERENCE OF 254MM OF PRECIPITATION BETWEEN THE DRIEST AND WETTEST MONTHS.THE AVERAGE TEMPERATURES VARY DURING THE YEAR BY 19.8 °C.

WINDS ARE GENERALLY LIGHT AND BLOW FROM NORTHEAST TO SOUTHEAST DIRECTION WITH EXCEPTION OF EASTERLY TO SOUTH EASTERLY WINDS THAT BLOWS ON SAME DAYS DURING SUMMER SEASON.
BEING A PART OF DELHI NCR, AND SO CLOSE PROXIMITY FROM THE CITY OF DELHI, NOIDA BECOMES A VERY HAPPENING PLACE BOTH IN TERMS OF ENTERTAINMENT AND WORK.IN SUMMER, THE TEMPERATURES MAY EXCEED TO 40 °C AT TIMES, WHEREAS IN WINTERS, THE TEMPERATURE GET AS LOW AS 1-2 °C.RAINFALL IS ALSO NOT TOO HIGH NOR TOO LOW HERE, WHICH ALSO SUPPORT AGRICULTURE VERY WELL.

SITE TOPOGRAPHY



SECTION AT S1-S1' ON SCALE 1:500



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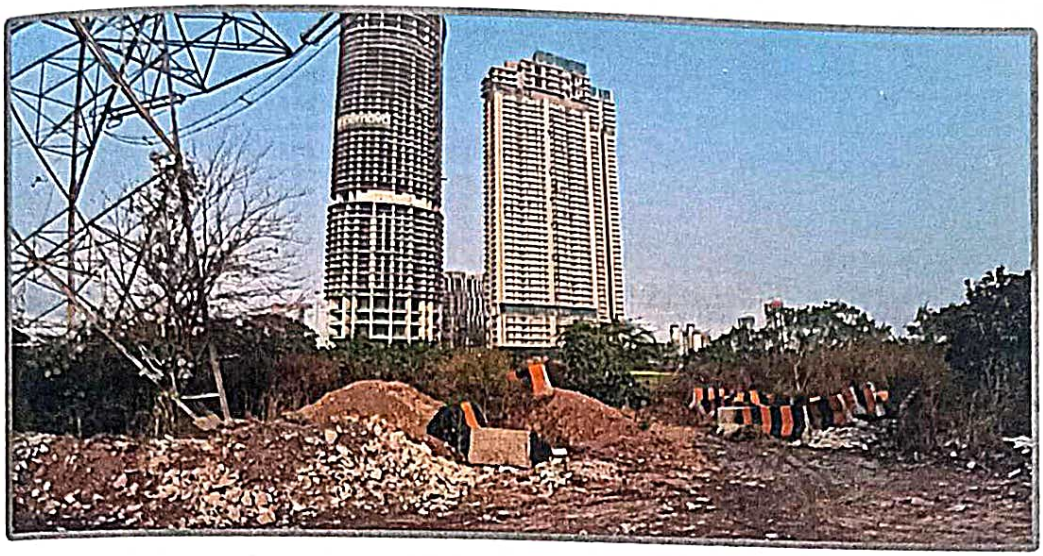


FROM THE JUNCTION

30 MT ROAD SIDE FROM BOUNDARY

30 MT ROAD SIDE

SOIL TYPE AND CONDITION

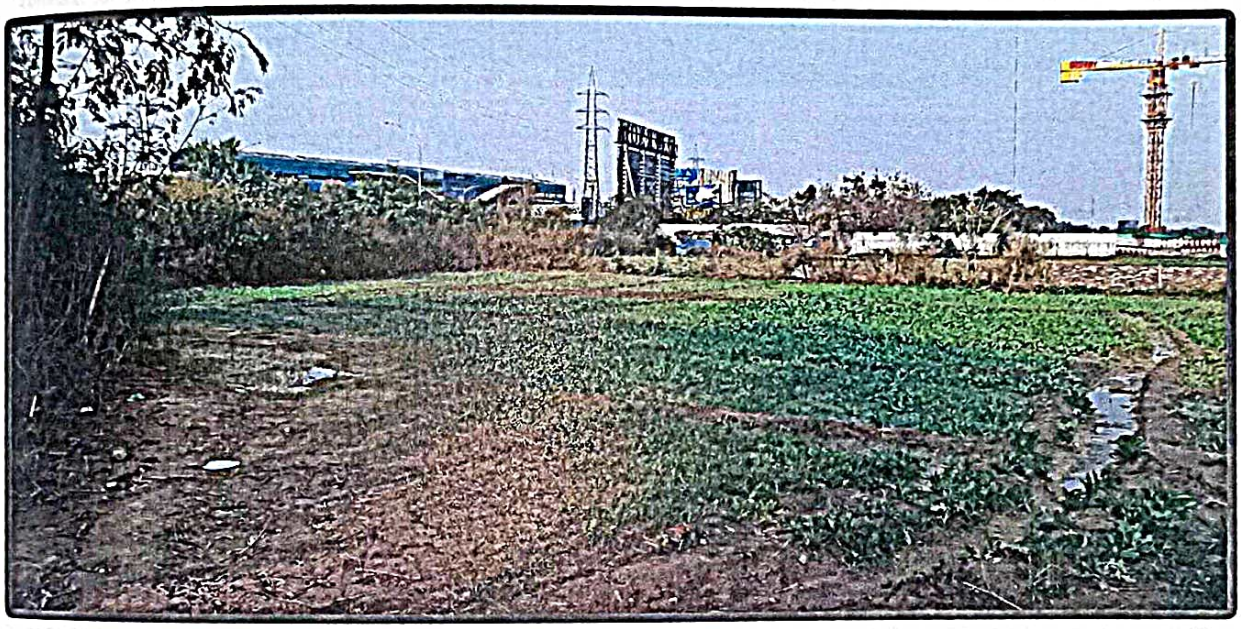
NOIDA FALLS UNDER THE CATCHMENT OF YAMUNA RIVER BANK, AND THE LAND IS ENTIRELY OLD RIVER BANK WITH VERY OLD SOIL WHICH KEPT ON DEPOSITING HERE WITH THE RIVER FLOW OVER HUNDREDS AND THOUSANDS OF YEARS. THE TYPE OF SOIL DEPOSITED IN NOIDA IS KNOWN AS "ALLUVIAL SOIL". ALLUVIAL SOILS ARE FORMED BY THE DEPOSITE OF THE SEDIMENTS BROUGHT BY RIVERS.MOST OF THE RIVERS ORIGINATES FROM HIMALAYAS AND BRING ALOMG HIGH AMOUNT OF SEDIMENTS WITH THEM.THE SOIL IS MADE UP OF PARTICLES LIKE SILT, SAND, AND CLAY.IT HAS ADEQUATE AMOUNT OF PHOSPHORIC ACID, POTASH AND LIME.ALLUVIAL SOILS ARE OF TWO TYPES:

1. OLD ALLUVIAL KNOWN AS BANGAR.
2. NEW ALLUVIAL KNOWN AS KHADDAR.

ON-SITE CONSIDERATION:

FARMING ID BEING PRACTICES ON THIS SITE.
VEGETABLES LIKE:

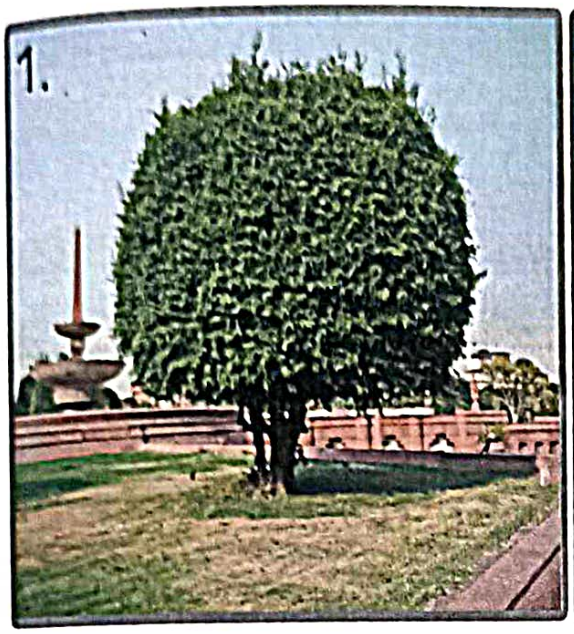
1. BRINJAL.
2. CAULIFLOWER.
3. SPINACH.
4. FENUGREEK (METHI).
5. OILSEED MUSTARD (SARSO).

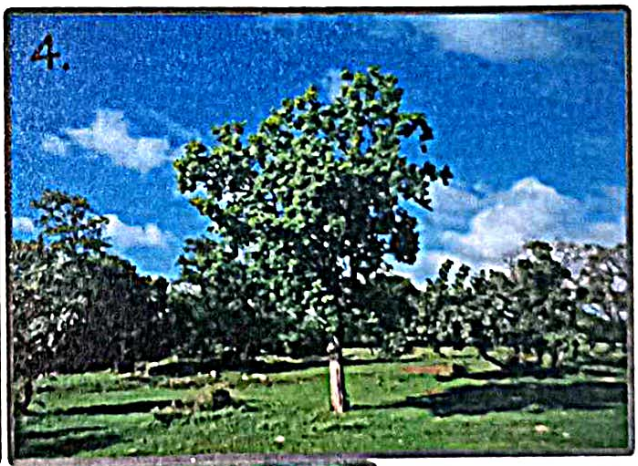


FARMING PRACTISE

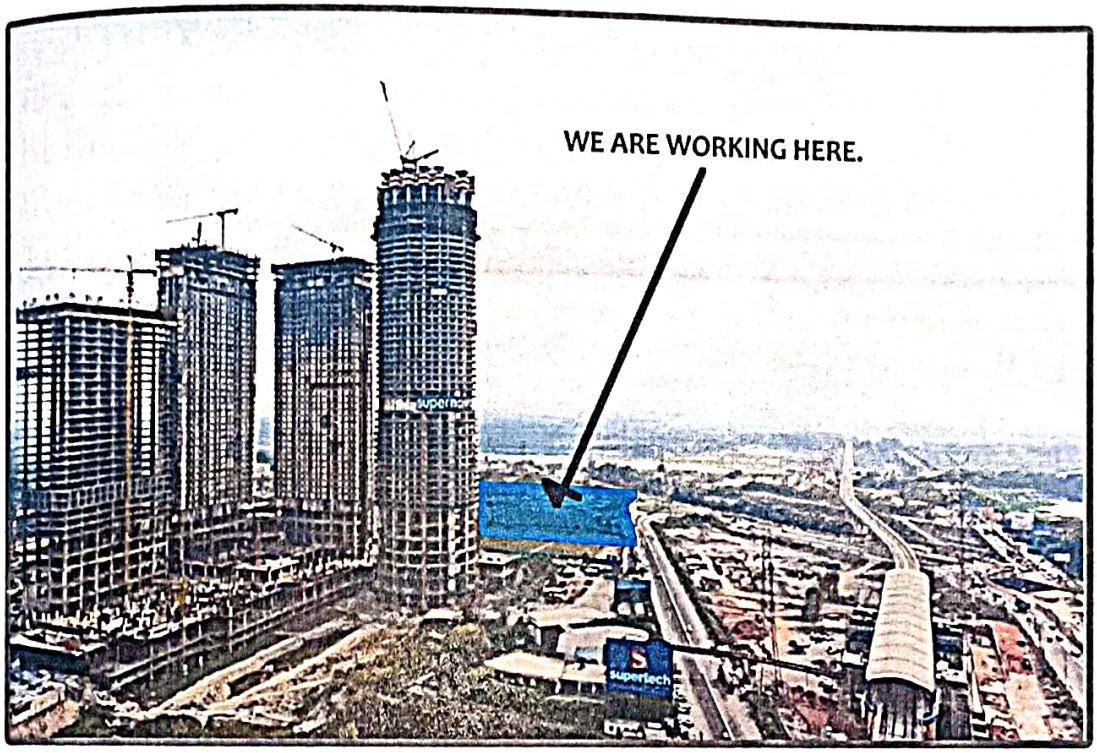
VEGETATION

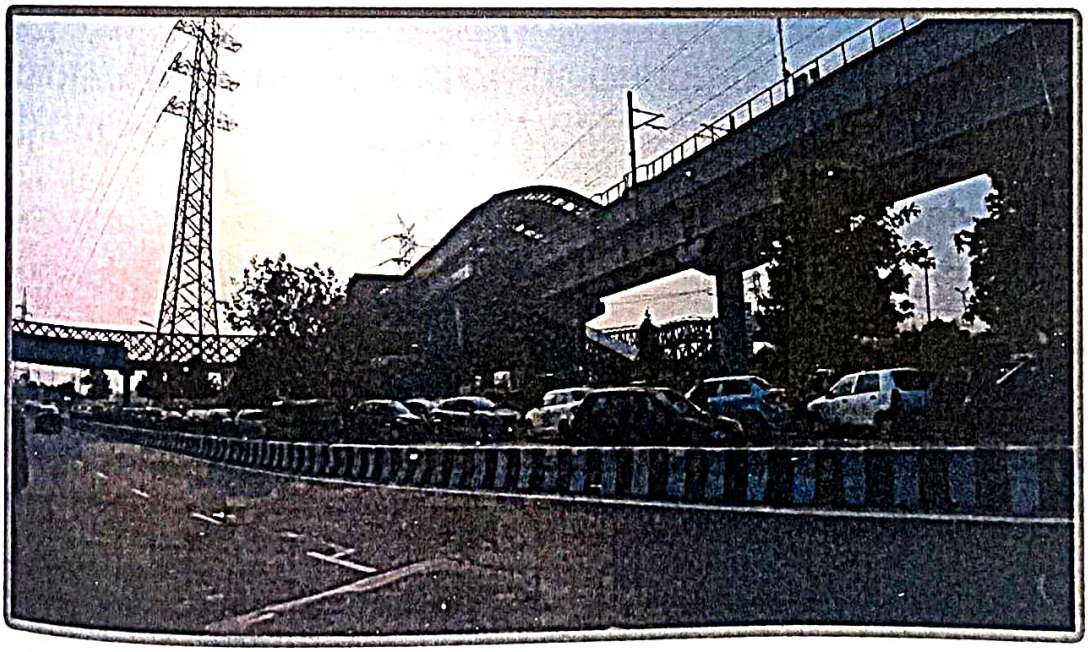
1. BISTENDU-DIOSPYROS CORDIFOLIA.
2. KOSAM-SCHLEICHERA OLEISA.
3. PALASH-BUTEA MONOSPERMA.
4. DOODHI-WRIGHTIA TINCTORIA.
5. PILKHAN-FICUS VIRENS.





AERIAL VIEW OF THE SITE SHOWING THE SITE LOCATION AND ITS RELATION WITH SUPERTECH SUPERNOVA, AND OKHLA BIRS SANCTUARY.THE SITE'S FRONT FACES THE YAMUNA RIVER, WHICH CAN BE USED AS A DESIGN ELEMENT, IN ORDER TO ORIENT THE BUILDING TOWARDS THE RIVER, TO ENHANCE THE VIEW FROM THE INSIDE OF THE BUILDING AND TO IMPROVE THE EXPERIENCES OF THE USERS OF THE BODY, SPECIALLY THE USERS OF HOUSING FACILITIES IN ORDER TO CONNECT WITH THE NATURE.





OKHLA BIRD SANCTUARY

LAND USE AND PROJECT

THE LAND USE OF THE SITE (PLOT 4) SECTOR 94 NOIDA, IS COMMERCIAL LAND USE TYPE, AND CAN ONLY BE USED FOR. ACTIVITIES RELATED TO COMMERCIAL
ACTIVITIES. THE THESIS TOPIC IS MIXED USED BUILDING, WHICH IS TOTALLY A NEW CONCEPT OF ARCHITECTURE NOW A DAYS, WITH THE INCREASE OF PROFFESSIONALS, THE LATEST TREND IS LIVING, WORKING, RECREATING AND SHOPPING, ALL UNDER ONE ROOF. THAT'S WHAT THE SOLUTION MIXED USED BUILDING GIVES TO ITS USERS. THE PROJECT REVOLVES AROUND 3 KEY POINTS.

1. RESIDENTIAL
2. RETAIL.
3. CORPORATE.(WHICH INCLUDES VERTICAL FARMING CONCEPT).

THIS SINGLE PROJECT WILL FULLFIL ALL THE THREE FACILITIES AND THE SERVICES UNDER ONE ROOF, SO THAT THE USER CAN LIVE, WORK, SHOP AND RECREATE IN A SAME AREA WITHOUT GOING OUT OF THE SITE, ENSURING LESS WASTAGE OF TIME, EFFICIENCY, LESS WASTAGE OF RESOURCES, ACCOMODATION OF LARGE POPULATION IN SAME AREA.

SWOT ANALYSIS

1. STRENGTHS FOR THE SITE INCLUDE ITS PROXIMITY FROM NOIDA-GR. NOIDA EXPRESSWAY AND OTHER IMPORTANT PARTS OF DELHI NCR AND ALSO CLIMATIC CONDITIONS ARE SUITABLE FOR WORK AND LIVING ALSO YAMUNA RIVER VIEW CAN ADD AN ELEMENT TO DESIGN.

2. WEAKNESSES OF THE SITE CAN ONLY BE IT IS NOT DIRECTLY FACING THE HIGHWAY.

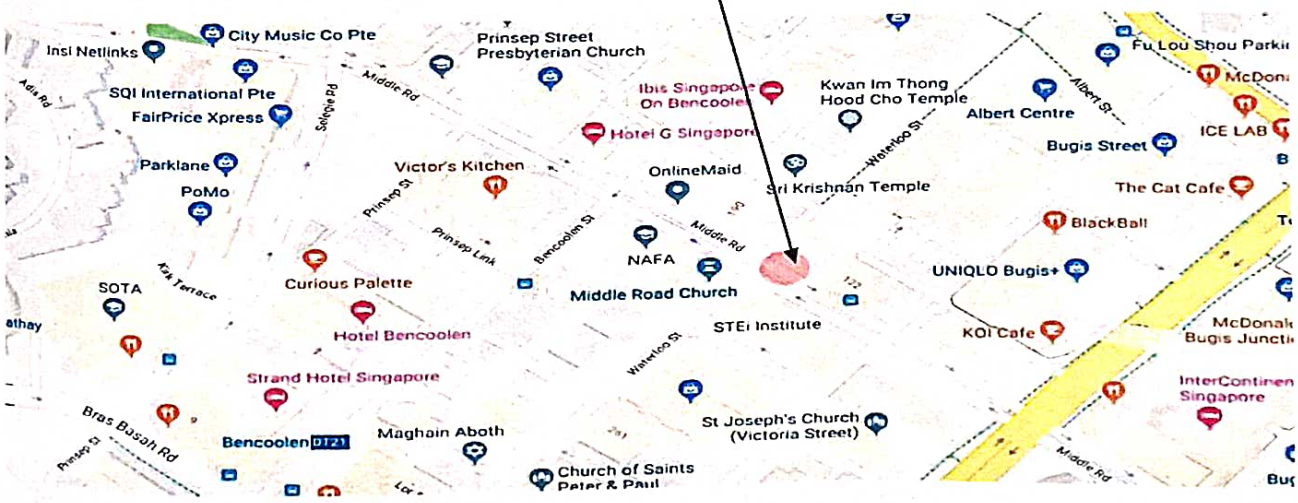
3. OPPORTUNITIES FOR THE PROJECT IS THE LASTEST TREND OF GIVING THE USERS VARIED FACILITIES AND SERVICES UNDER ONE ROOF. MIXED USED DEVELOPEMENT COMMERCIAL SITES ATTRACT MORE PEOPLE AS IT CAN GIVE FACILITIES LIKE HOUSING, RETAIL, AND OFFICE AREAS AT ONE SINGLE PLACE.

LITERATURE STUDY 1

EDITT TOWER, SINGAPORE

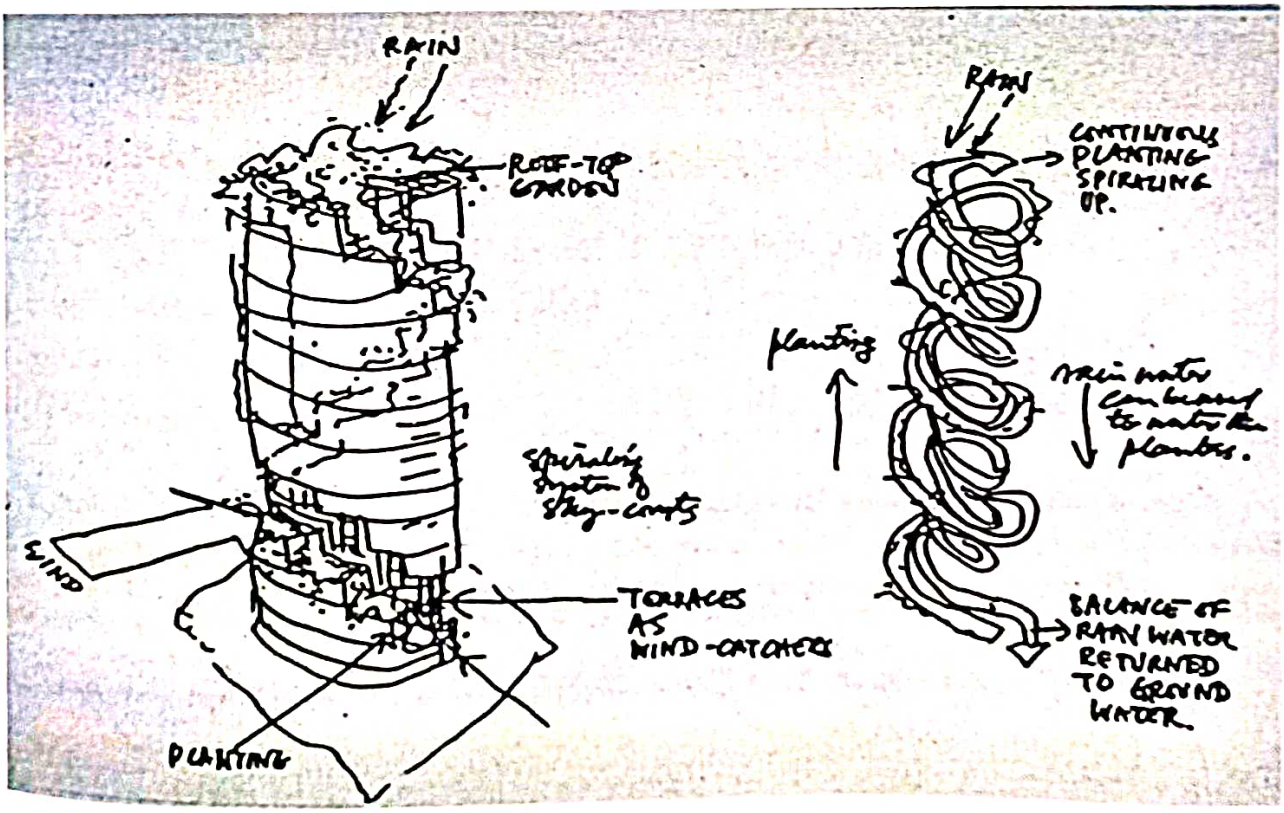
EDITT TOWER IS LOCATED IN SINGAPORE AT JUCTION OF WATERLOO ROAD AND VICTORIA STREET, DESIGNED BY T.R. HAMXAH AND YEANG DEVELOPERS AND SPONSORED BY URBAN REDEVELOPEMENT AUTHORITY AND NATIONAL UNIVERSITY OF SINGAPORE.

SURROUNDING SITE IS DEVELOPED IN CONGESTED MANNER AND THE TRAFFIC FLOW IS ADVANCE. THUS DEVELOPING THE TOWER AT THIS AREA WAS BENEFICIAL FOR THE TRADE AND ECONOMY PURPOSE AND HELPS THE SURROUNDING PEOPLE TO GET FRESH AIR IN A CONGEST AREA.



CONCEPT DEVELOPEMENT

INITIALLY THE ARCHITECT FOCUSES ON THE DEVELOPEMENT OF SERVICES AND AMENITIES IN THE BUILDING BLOCK AND THUS STEP BY STEP MOVED ON THE DEVELOPEMENT OF GREEN AREA AND PLANTATION AREA BY PROVIDING LINKS TO THE AMENITIES AND ADEQUATE OPEN SPACE. THIS CONCEPT INCLUDES DESIGN ACCORDING TO THE WIND DIRECTION AND SUN PATH.



PROJECT DESCRIPTION

ARCHITECT: T.R HAMZAH & YEANG SDN BHD.
URA (URBAN REDEVELOPEMENT AUTHORITY) SINGAPORE (SPONSOR).
EDITI (ECOLOGICAL DESIGN IN THE TROPICS) (SPONSOR).
NUS (NATIONAL UNIVERSITY OF SINGAPORE) (SPONSOR).

LOCATION: JUCTION OF WATERLO ROAD AND VICTORIA STREET, SINGAPORE.
NOS OF STOREYS: 26.

DATE START: 1998 (COMPETITION: DESIGN).

COMPLETION DATE: PENDING AREA.

TOTAL GROSS AREA: 6,033 SQMT.
TOTAL NET AREA: 3,567.16 SQMT.
TOTAL AREA OF PLANTATION: 3,841.34 SQMT.
PLOT RATIO: 7:1.
HEIGHT: 88.46 MT.

PRINCIPAL-IN-CHARGE: DR.KEN YEANG.
PROJECT ARCHITECT: ANDY CHONY.

DESIGN ARCHITECTS: RIDZWAN FATHAN (PIC), CLAUDIA RITSCH AZMAN CHE MAT.
DESIGN TEAM: AZUDDIN SULAIMAN, SEE-EE-LING.
DRAFTING: SZE THO KOK CHENG.
C & S AND M & E ENGINEERS: BATTLE MC CARTHY (LONDON).
EMBODIED ENERGY EXPERT: BILL LAWSON (UNIVERSITY OF SYDNEY).
SWAN & MACLAREN ARCHITECTS: JAMES LEONG (ARCHITECT-OF-RECORD).

DESIGN BEGAN WITH THE MAPPING IN DETAILS OF THE INDIGENOUS PLANTING WITHIN A 1 MILE RADIUS VICINITY OF THE SITE TO IDENTIFY SPECIES TO BE INCORPORATED IN THE DESIGN THAT WILL NOT COMPETE WITH THE INDIGENOUS SPECIES OF THE LOCALITY.

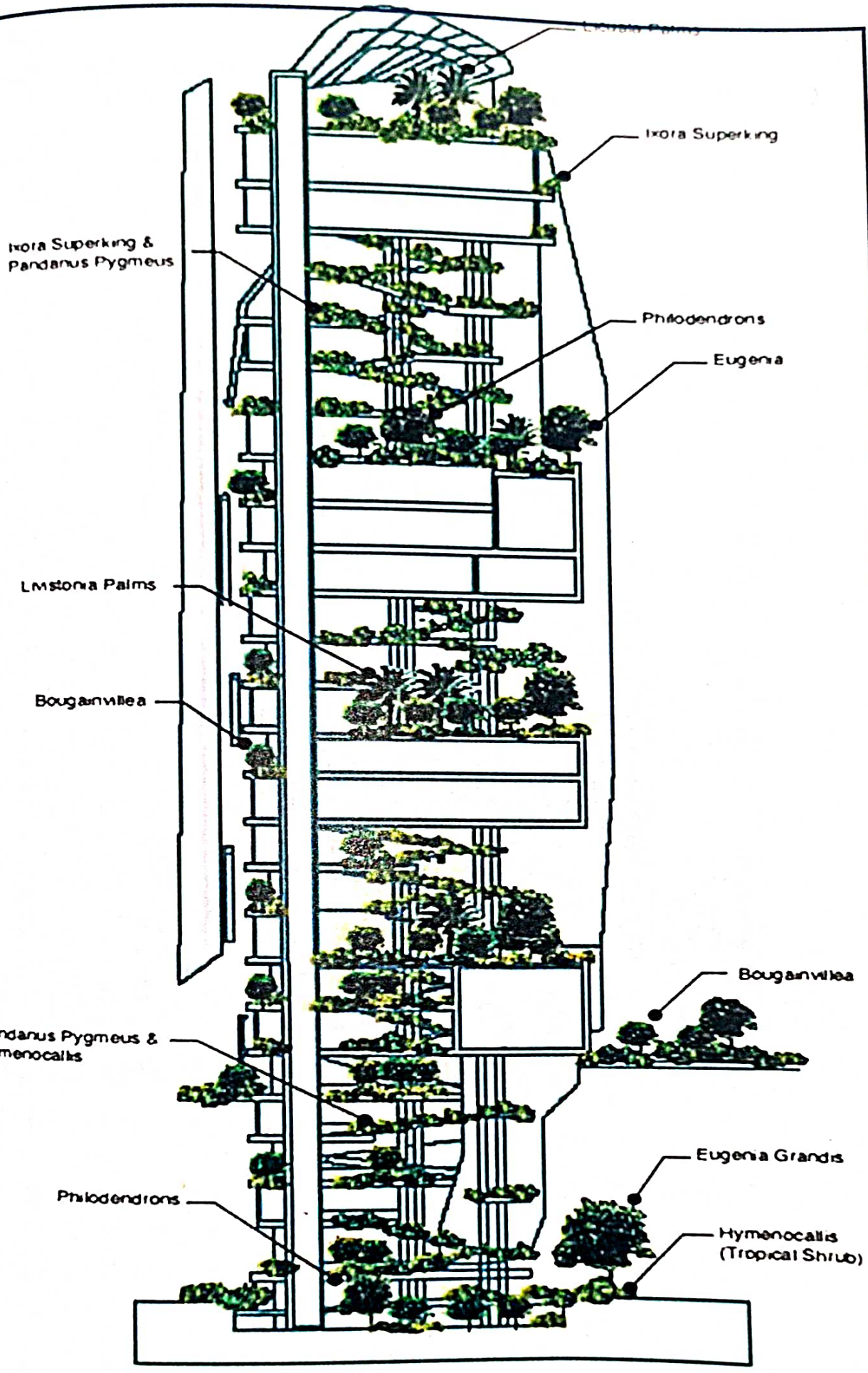
THE VEGETATION AREAS ARE DESIGNED TO BE CONTINUOUS AND TO RAMP UPWARDS FROM THE GROUNG PLANE TO THE UPPERMOST FLOOR IN A LINKED LANDSCAPE RAMP. THE DESIGN'S PLANTED-AREA.

DESCRIPTION

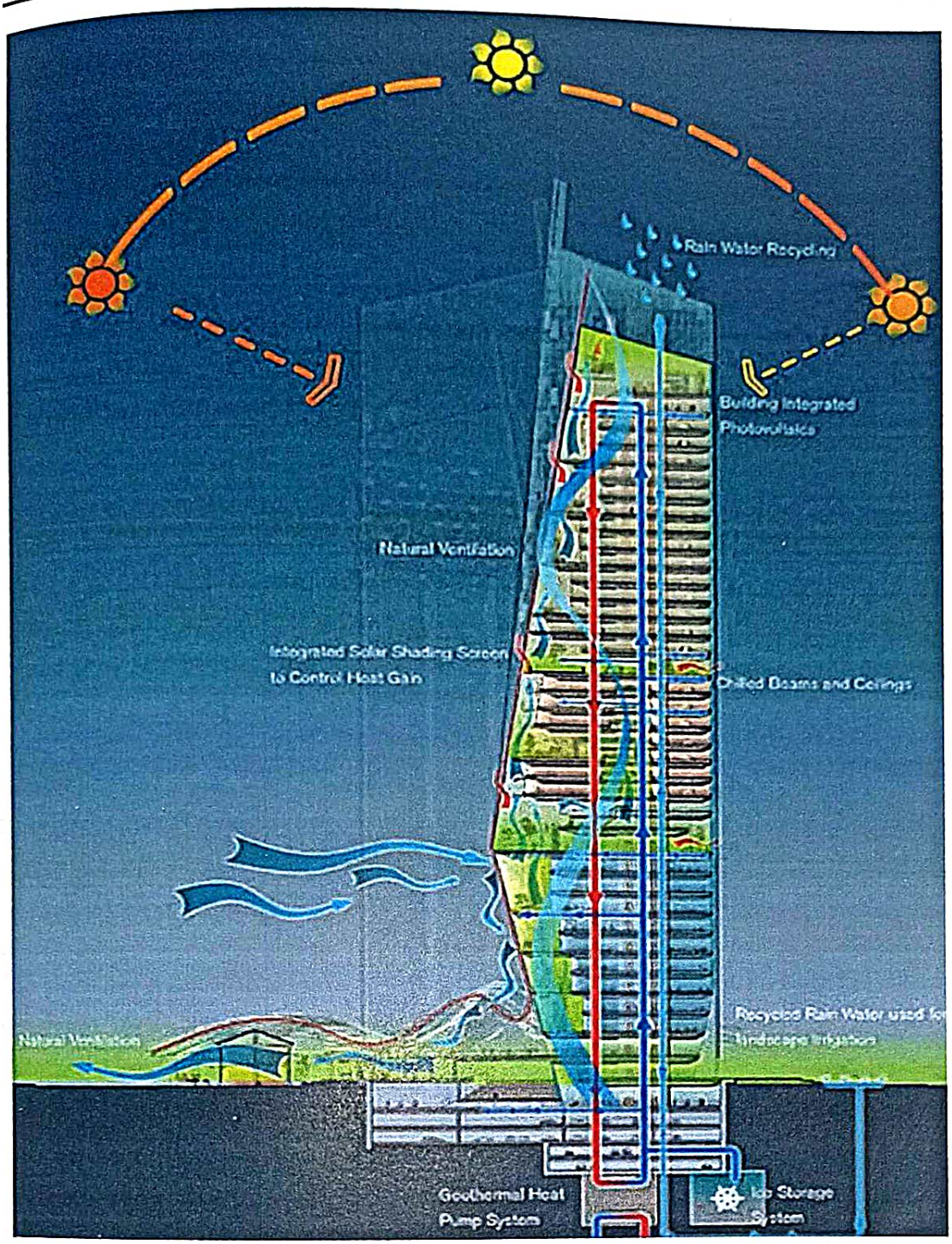
THE VEGETATION AREAS ARE DESIGNED TO BE CONTINUOUS AND TO RAMP UPWARD FROM THE GROUND PLANE TO THE UPPER MOST FLOORS IN ALINKED LANDSACPE. THE UNIQUE DESIGN FEATURE OF THE SCHEME IS IN THE WELL PLANTED FACADES AND VEGETATED - TERRACE WHICH HAVE GREEN AREAS THAT APPROXIMATELY THE GROSS USEABLE AREAS (I.E: GFA @ 6033 SQMT) OF THE REST OF THE BUILDING.
THE ARCHITECTS HAVE COMPLETED A STUDY OF THE EMBODIED ENERGY AND GREEN HOUSE-GAS EFFICIENCY OF THE BUILDING MATERIALS AS WELL, BUT HAVE OPTED IN SOME CASE FOR HIGHER ENERGY INTENSITY CONSTRUCTION MATERIALS, ESPECIALLY THE SOLAR PANELS DUE TO THEIR PAYBACK IN ENERGY DURING THE LIFT OF THE BUILDING AND RECYCLEABLE BUILDING MATERIALS SUCH AS STEELK AND ALUMINIUM.
COMPOSITE TIMBER-FLOOR CASSETTE WILL REPLACE THE COMMONLY USED CONCRETE FLOORS TO ACHIEVE GRAINS INENERGY EFFICIENCY CONSTRUCTION.

PLANTATION CONCEPT

1.	LICUAIA PLAMS	PALM	
2.	IXORA SUPERKING	IXORA	
3.	PHILODENDRONS	SELLOUM	
4.	EUGENIA	STOPPER	
5.	BONGAIN VILLEA	PAPERFLOWER	
6.	HYMENOCALLIS	BEACH SPIDERLILY	
7.	LIVISTONA PLAMS	CABBAGE TREE	


Ixora Superking
Ixora Superking &
Pandanus Pygmeus
Philodendrons
Eugenia
Livistonia Palms
Bougainvillea
Bougainvillea
Pandanus Pygmeus &
Hymenocallis
Eugenia Grandis
Philodendrons
Hymenocallis
(Tropical Shrub)

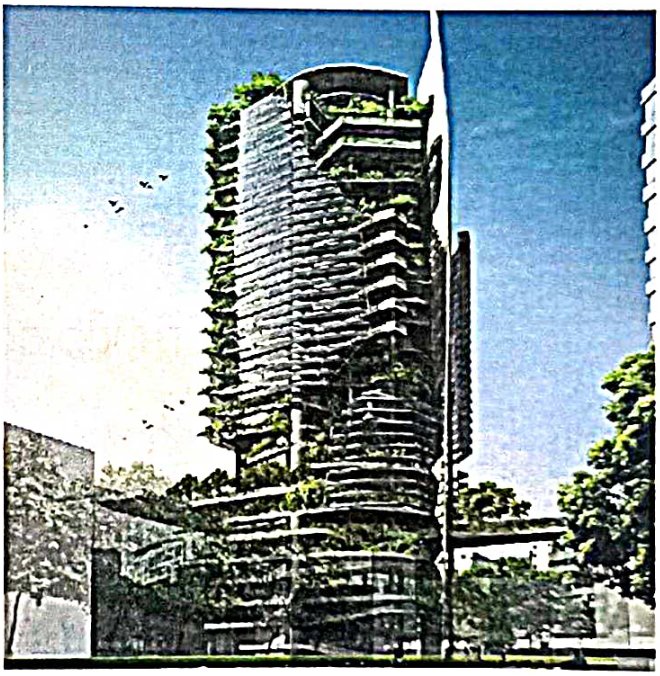
SUNPATH & MECHANISM



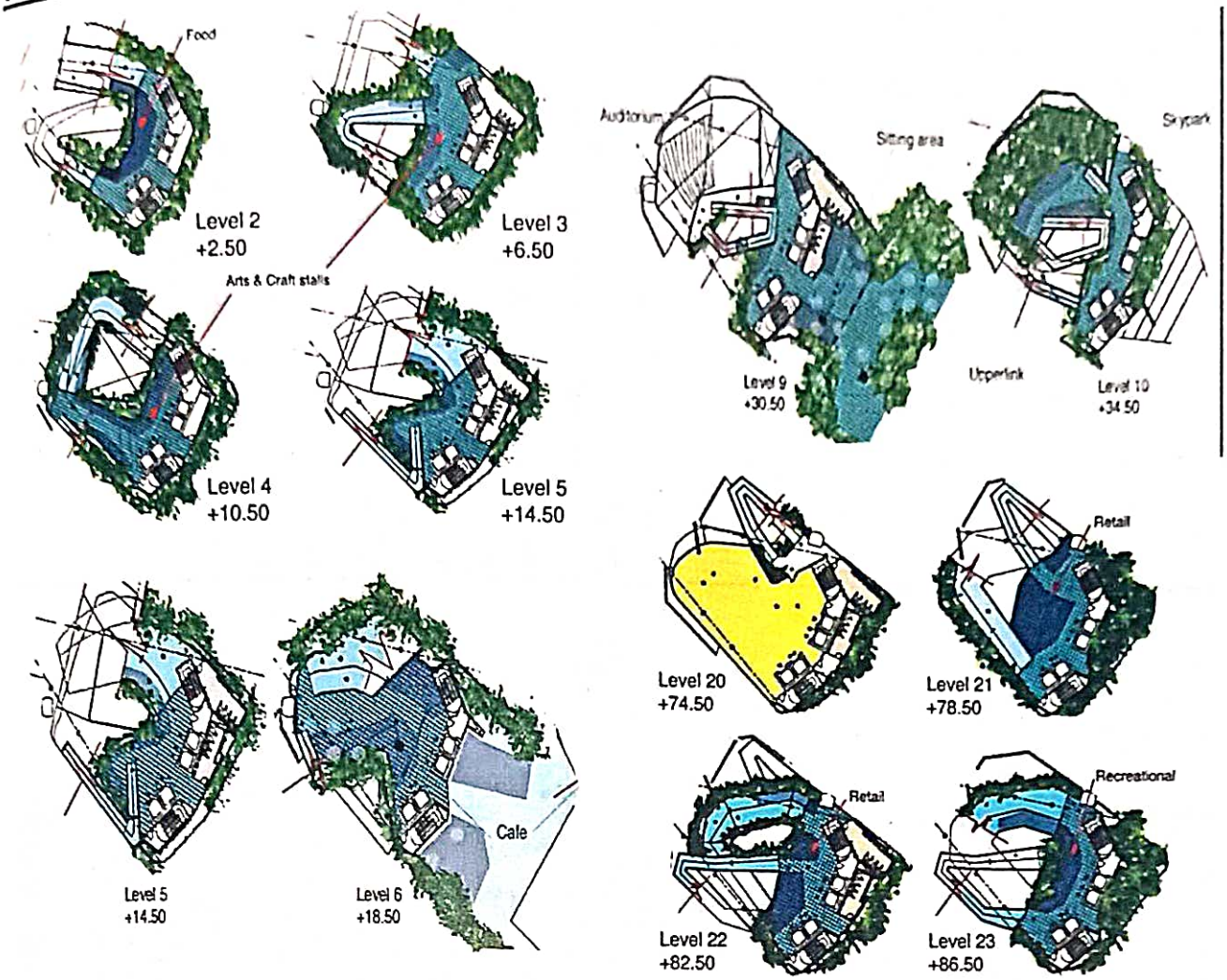
1. GEOTHERMAL HEAT PUMPING SYSTEM
2. NATURAL VENTIALTION
3. INTEGRATED SOLAR SHADING SCREEN TO CONTROL HEAT
4. RAIN WATER STORAGE SYSTEM
5. LEVEL 6:SERVICE CORE, CAFE.
6. PHOTOVOLTAIC CELLS

USEABLE AREA= 6,032.69 SQMT.
PLANTED AREA= 3,841.34 SQMT.
= 63%.

THE VEGETATION SPECIE'S SELECTED FOR THIS BUILDING IS BASED ON THE PERCENTAGE OF THE DIFFERENT INDIGENEOUS PLANT MATERIAL IN THE AREA THUS ESTABLISHING A REPRESENTATIIVE LANDSCAPE OF THE AREA.THIS TO ENSURE THAT THE SPECIES USED ARE ONES WHICH ARE NOT IN COMPETITION WITH OTHER SPECIES ON THE SITE AND SURROUNDINGS.THE OTHER FACTORS CONSIDERED IN OUR SELECTION OF PLANTING ARE PLANTING DEPTH, LIGHT QUALITY, DEGREE OF MAINTANCE, ACCESS, ORIENTATION, WIND WALLS/SOLAR PANELS/SPECIAL GLAZING FACTORS.



FLOOR PLANS



ZONING

1. LEVEL 2: SERVICE AREA, FOOD COURT.

2. LEVEL 3: SERVICE CORE, ART AND CRAFT STALLS.

3. LEVEL 4: SAME AS OF LEVEL 3.

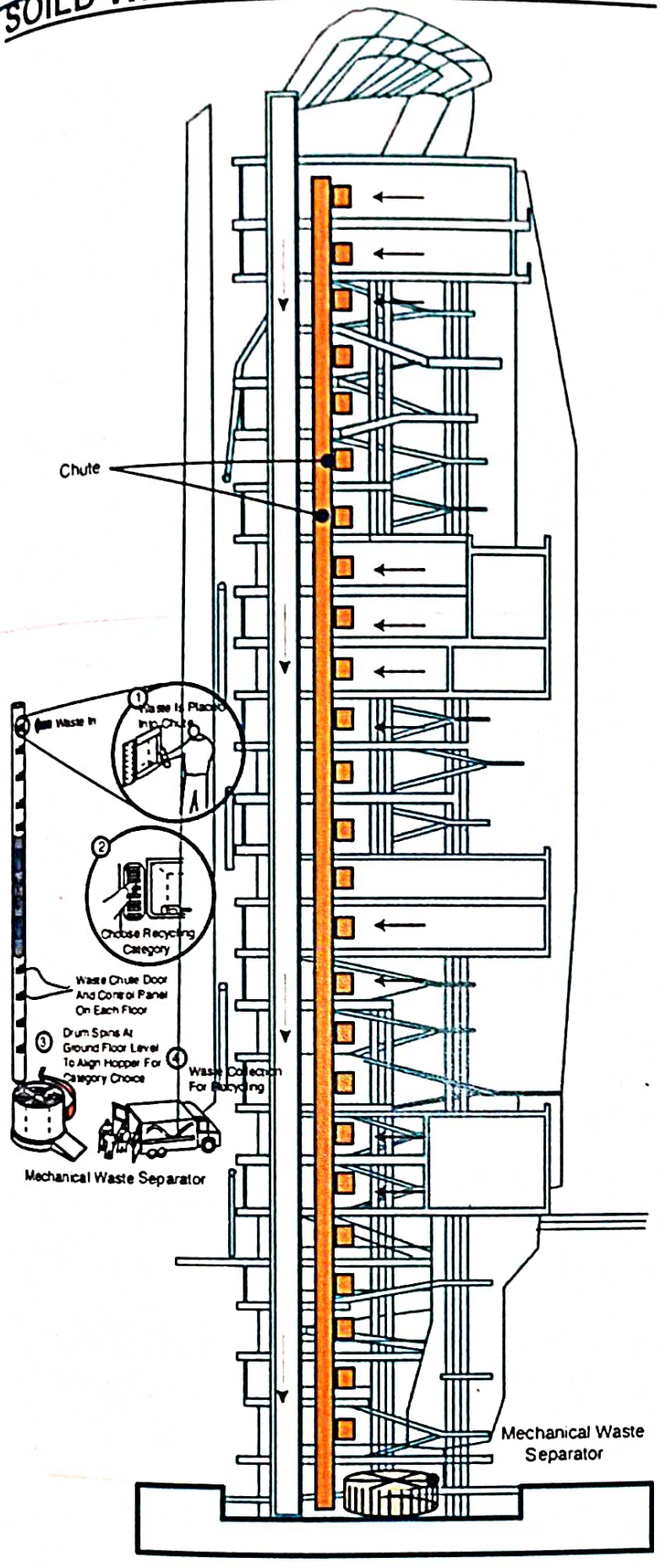
4. LEVEL 5: SERVICE CORE, FOOD COURT.

5. LEVEL 6: SERVICE CORE, CAFE.

6. LEVEL 9: SERVICE CORE, AUDITORIUM, SEATING AREA.

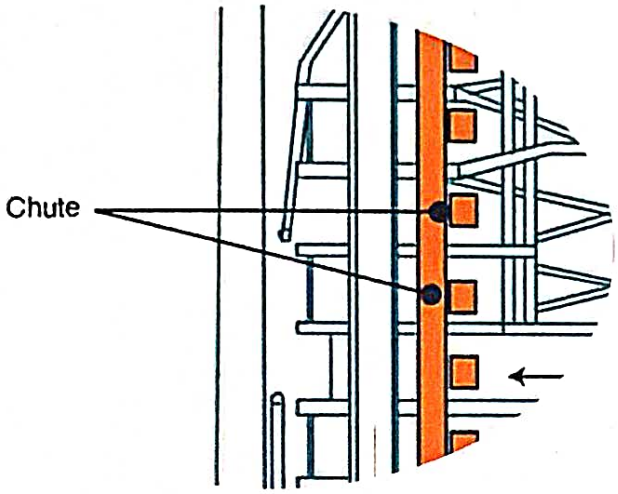
7. LEVEL 10: SERVICE CORE, SKY PARK, SEATING, UPPER LINK.

SOILD WASTE RECYCLE CONCEPT



SOLID WASTE CALCULATION

ESTIMATE SEWAGE SLUDGE FOR COMMERCIAL BUILDING IS 230 LITRES PER POPULATION EQUIVALENT (P.E) PER DAY @ 3. P.E. PER 100 SQMT. GROSS AREA.
GROSS AREA BUILDING AREA =6032 SQMT.
AMOUNT OF SEWAGE COLLECTED=41,620.8 LT
=41.62 CUBICMT.PER DAY.
=15.190 CUBICMT PER ANNUM.



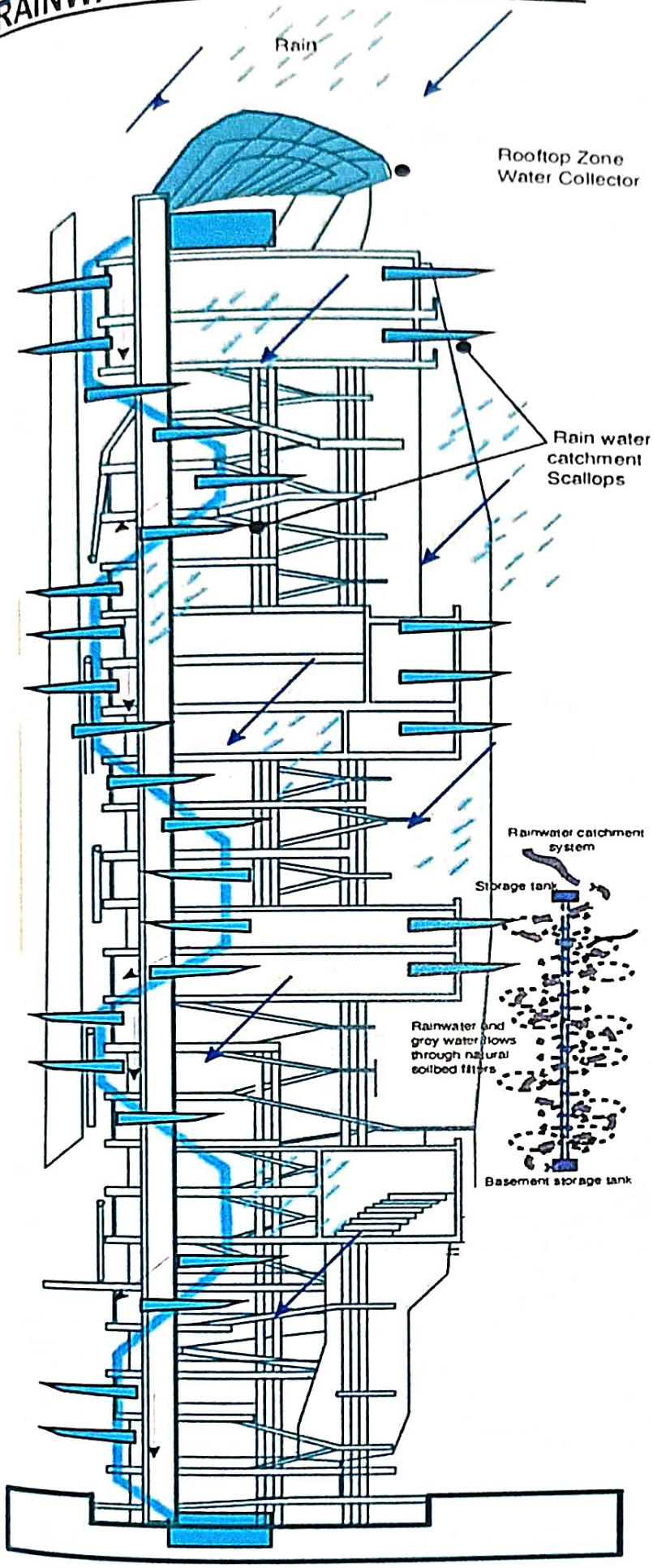
RECYCLING OF WASTE MATERIALS

1. WASTE MATERIALS ARE PLACED IN THE CHUTE.

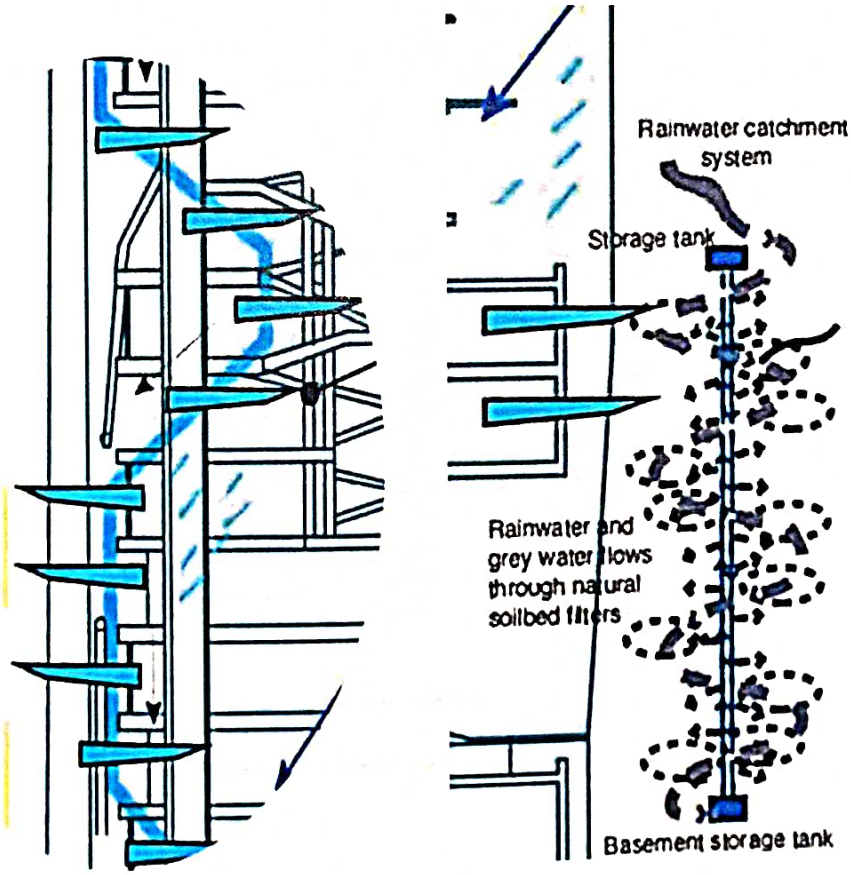
2. AFTER PLACING THE WASTE SELECT THE CATEGORY (RECYCLE, REDUSE).

3. THROUGH THESE PIPES THEY ARE COLLECTED AT DRUM SPINS AT GROUND LEVEL TO ALIGN HOPPER FOR CATEGORY CHOICE.

RAINWATER RECYCLE CONCEPT

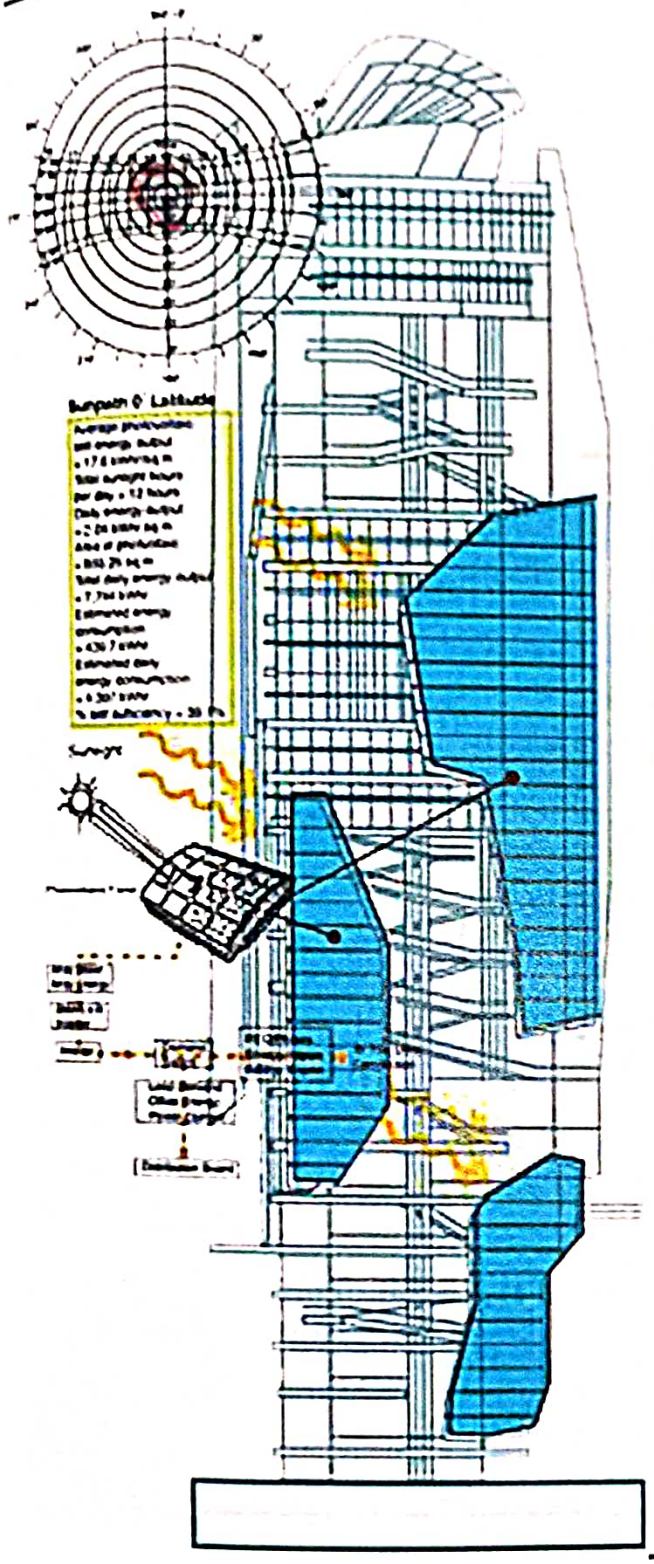


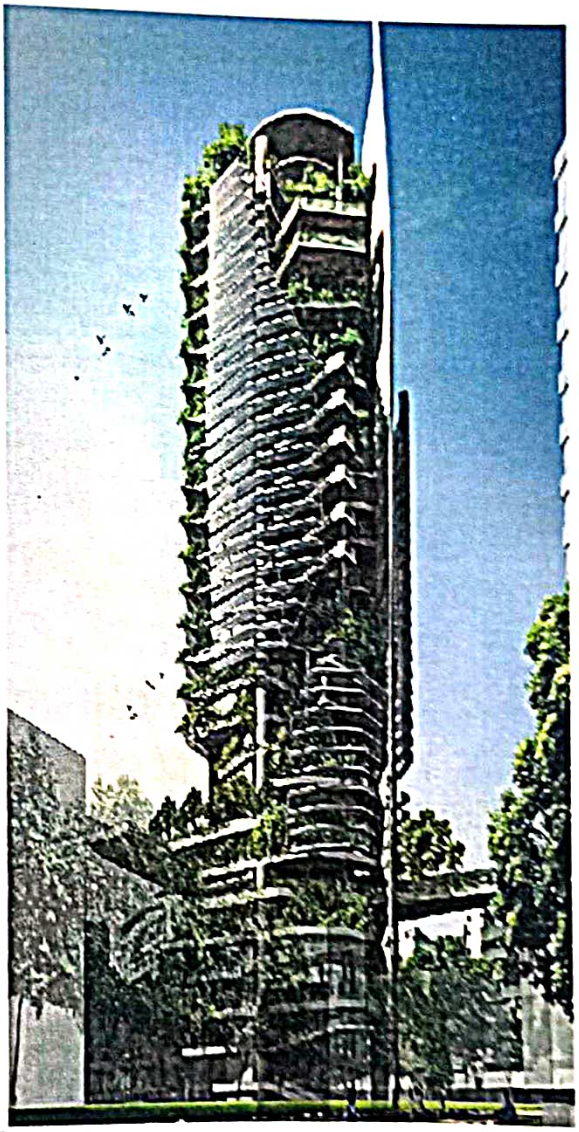
TOTLA GROSS AREA = 6032 SQMT.
WATER REQUIREMENT FOR OFFICE IS 20 GALLON PER DAY PER 10 SQMT. GROSS AREA+10% WASTAGE.
TOTAL REQUIREMENT.
=13,270 PER GALLON PER DAY.
=60.3 CUBIC MT PER DAY X 365 DAYS.
=22,019 CUBIC MT PER ANNUM.
TOTAL CATCHMENT AREA= 518 SQMT.
SINGAPORE AVERAGE RAIN FALL PER ANNUM =23.4039 MT.
TOTAL WATER COLLECTION =12141 CIBIC MT.
TOTAL REQUIREMNET=22019 CUBIC MT.
RAINWATER STORED=12141 CUBIC MT.
HENCE IN %=12141/22019.
=0.551 X 100.
=55.1%.
WATER SELF SUFFICIENCY OF BUILDING=55.1%



RAIN WATER CATCHEMENT SCALLOPS AND COLLECTION TANK

PHOTOVOLTAIC CELLS

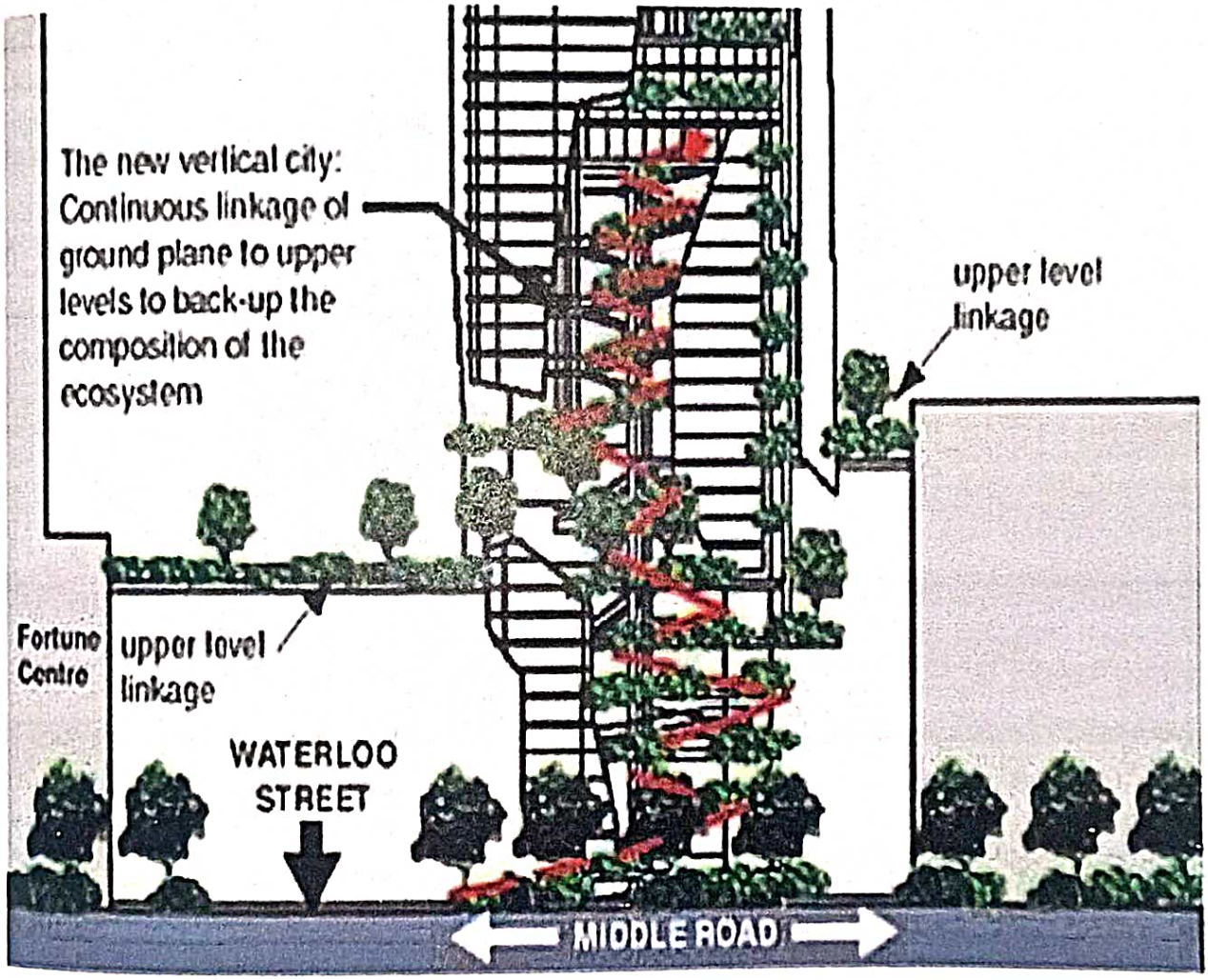




BUILDING DESIGN

THE BUILDING EMPLOYS WHAT THE ARCHITECT TERMS "LOOSE-FIT" DESIGN, FEATURING REMOVABLE PARTITIONS AND FLOORS, AND MECHANICAL JOINTING OF MATERIALS AS OPPOSED TO THE USE OF CHEMICAL BONDING THIS WILL AID FUTURE RE-USE OF THE BUILDING AND RECYCLING OF MATERIALS.

THE BUILDING'S DESIGN AIMS TO REDUCE THE USE 0F MECHANICAL AIR CONDITIONING SYSTEMS AND ARTIFICAL LIGHTING.



LITERATURE STUDY 2

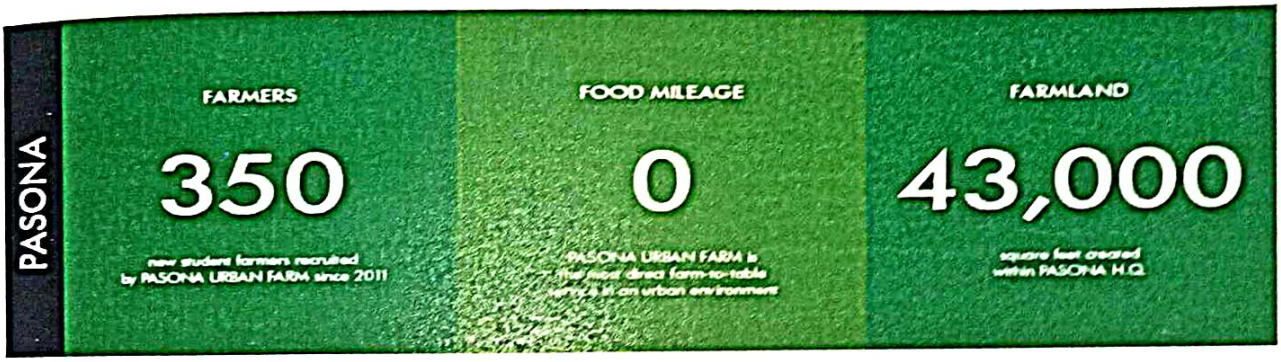
PASONA HQ, TOKYO

1. PROJECT TYPE: RENOVATION AND REFURBISHIMG.
2. BUILDING TYPE: OFFICE.
3. ARCHITECT: KONO ARCHITECT, NEW YORK.
4. YEAR: 2010.
5. AREA: 215000 SQMT.
6. CLIENT: PASONA.
7. CONTEXT: URBAN.

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF A DOUBLE-SKIN GREEN FACADE, OFFICES, AN AUDITORIUM, CAFETERIAS, A ROOFTOP GARDEN AND MOSTLY NOTABLY, URBAN FARMING FACILITIES INTEGRATED WITHIN THE BUILDING. THE GREEN SPACE TOTALS OVER 43000 SQFT. WITH 200 SPECIES INCLUDING FRUITS, VEGETABLES AND RICE THAT ARE HARVESTED, PREPARED AND SERVED AT THE CAFETERIAS WITHINTHE BUILDING. IT IS THE LARGEST AND MOST

DIRECT FARM-TO-TABLE OF ITS KIND EVER REALISED INSIDE AN OFFICE BUILDING IN JAPAN.
THE CROPS HARVESTED IN PASONA HQ ARE SERVED WITHIN THE BUILDING CAFETERIAS, IT HIGHLIGHTS 'ZERO FOOD MILEAGA' CONCEPT OF A MORE SUSTAINABLE FOOD DISTRIBUTION SYSTEM THTA REDUCES ENERGY AND TRANSPORTATION COST.
FARMLAND IN PASONA HQ IS HIGHLY EFFICIENT URBAN ARABLE LAND, STACKED AS A VERTICAL FARM WITH MORDEN FARMING TECHNOLOGY TO MAXIMIZE CROP YIELDS.



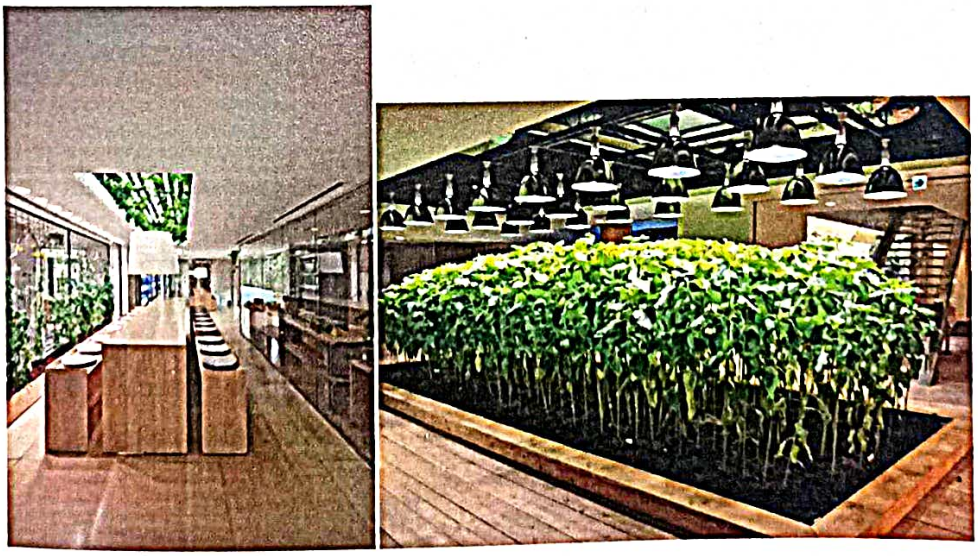
DOUBLE-SKIN GREEN FACADE FEATURES SEASONAL FLOWERS AND ORANGE TREES PLANTED WITHIN THE 3FT DEEP BALCONIES. PARTIALLY RELYING ON NATURAL EXTERIOR CLIMATE, THESE PLANTS CREATE A LIVING GREEN WALL AND DYNAMICS IDENTIFY TO THE PUBLIC. THE BALCONIES ALSO HELP SHADE AND INSULATE THE INTERIORS WHILE PROVIDING FRESH AIR WITH OPERABLE WINDOWS, A PRACTICAL FEATURE NOT ONLY RARE FOR A MIDRISE COMMERCIAL BUILDING BUT ALSO HELPS REDUCE HEATING AND COOLING LOADS OF THE BUILDING DURING MODERATE CLIMATE.
THE ENTIRE FACADE IS THEN WRAPPED WITH DEEP GIRD OF FINS, CREATING FURTHER DEPTH, VOLUME AND ORDERS TO THE ORGANIC GREEN WALL

WITHIN THE INTERIOR, THE DEEP BEAMS AND LARGE COLUMNS OF THE EXISTING STRUCTURE ARE ARRANGED IN A TIGHT INTERVAL CAUSING LOW INTERIOR CEILING HEIGHT OF (7'-6"). WITH BUILDING SERVICES PASSING BELOW, SOME AREA WAS EVEN LOWER AT (6'-8"). INSTEAD, ALL DUCTS, PIPES, AND THEIR VERTICAL SHAFT WERE RE-ROUTED TO THE PERIMETER, ALLOWING MAXIMUM HEIGHT BETWEEN THE BEAMS.
LIGHTINGS ARE THAN INSTALLED, HIDDEN ON THE BOTTOM VERTICAL EDGES OF THE BEAMS, TURNING THE SPACES BETWEEM THE BEAMS INTO LARGE COVE WITHOUT FURTHER LOWERING THE CEILING. THIS LIGHTING METHOD, USED THROUGHOUT THE WORKSPACE FROM SECOND FLOOR TO 9TH FLOOR, ACHIEVED 30% LESS ENERGY THAN THE CONVENTIONAL CEILING MOUNTED METHOD.

FARMING TECHNIQUES

USING BOTH HYDROPONIC AND SOIL BASED FARMING. IN PASONA HQ, CROPS AND OFFICE WORKERS SHARE A COMMON SPACE. FOR EXAMPLE, TOMATO VINES ARE SUSPENDED ABOVE CONFERENCE TABLES, LEMON ANS PASSION FRUIT TREES ARE USED AS PARTITIONS FOR MEETING SPACES, SALAD LEAVES ARE GROWN INSIDE SEMINAR ROOMS AND BAEN SPROUTS ARE GROWN UNDER BENCHES.

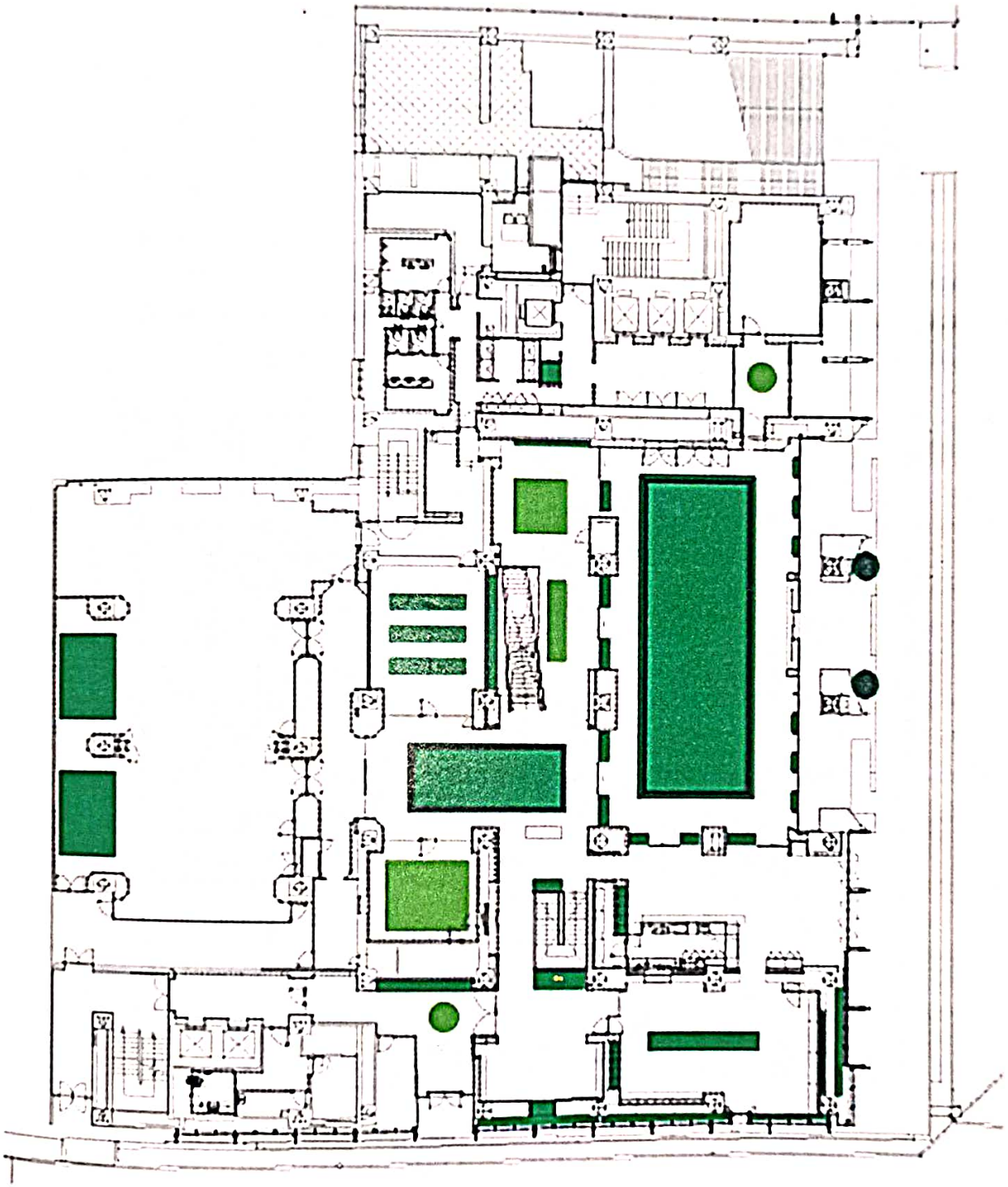
CONFERENCE ROOM



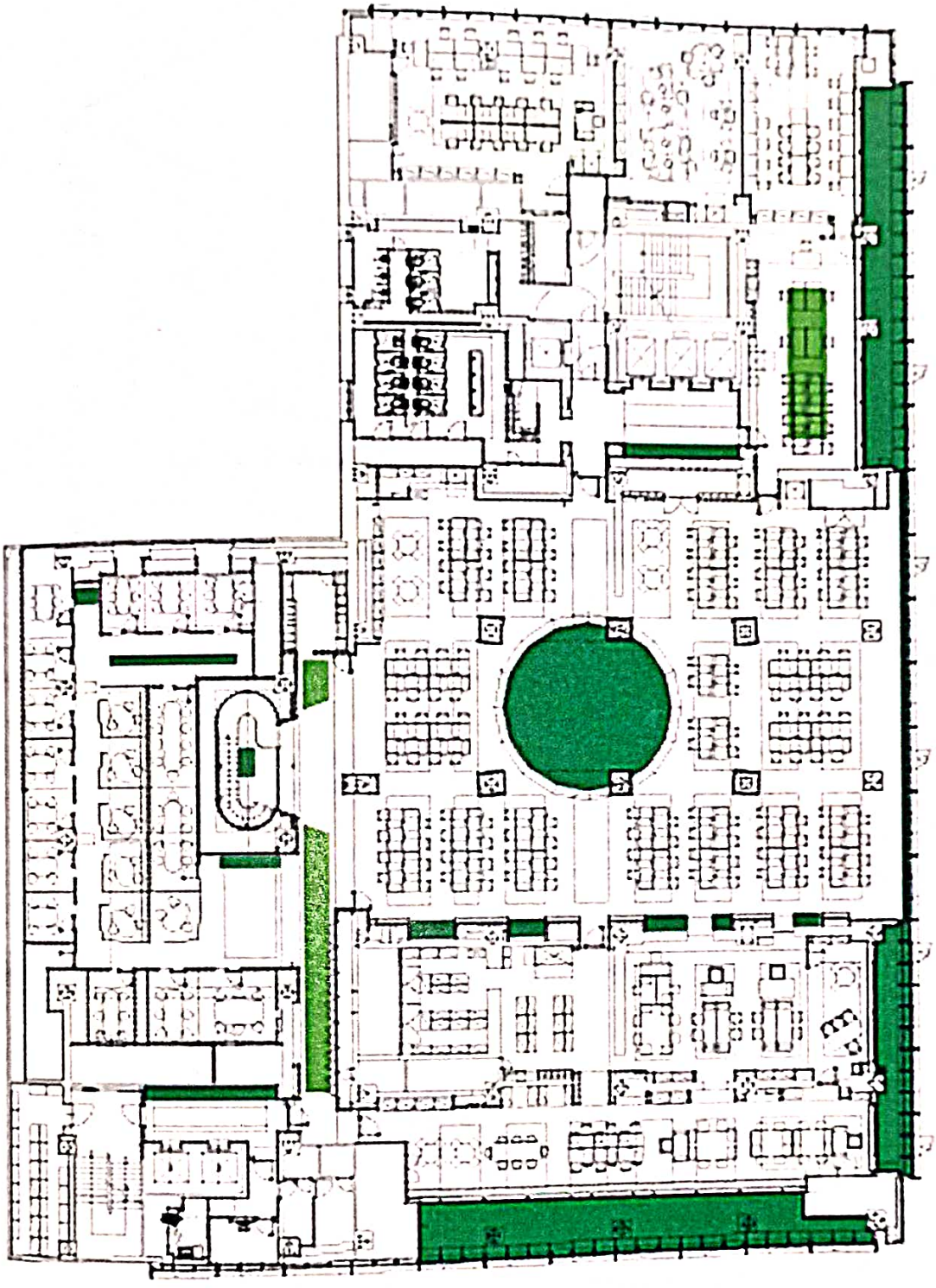
DINING AREA

FARMING AREA

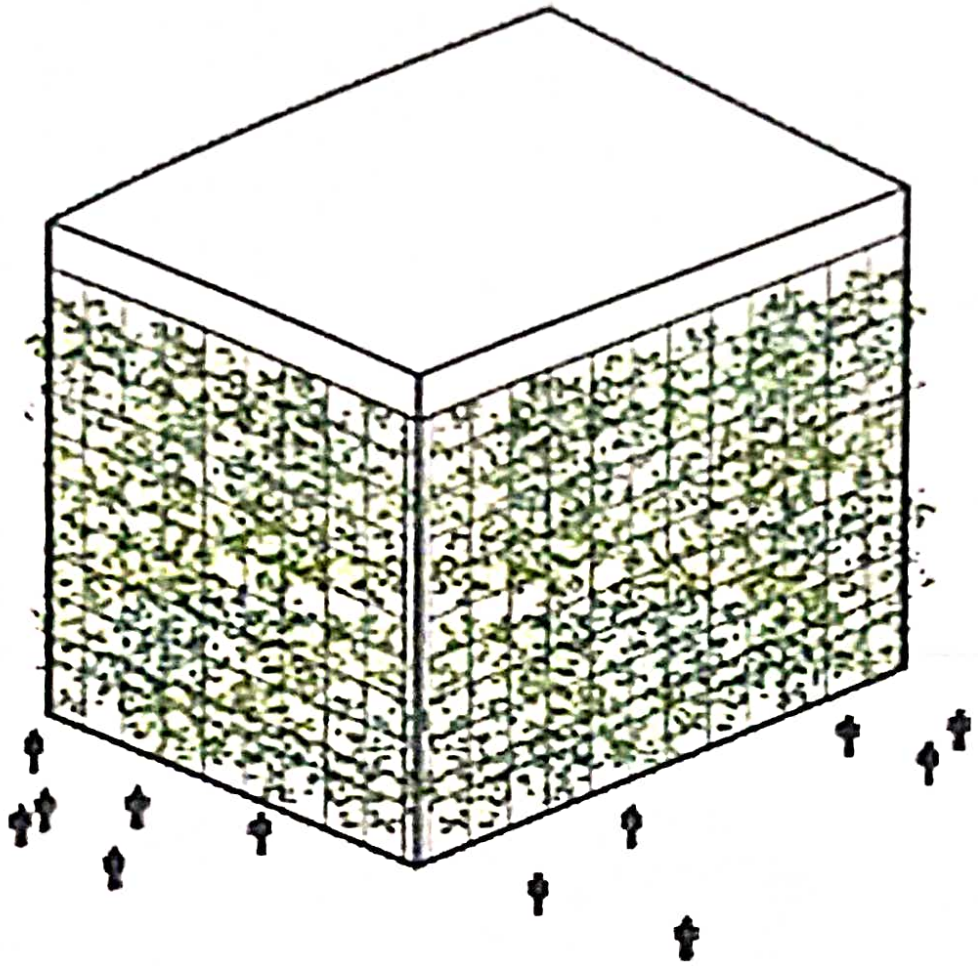
FLOOR PLAN



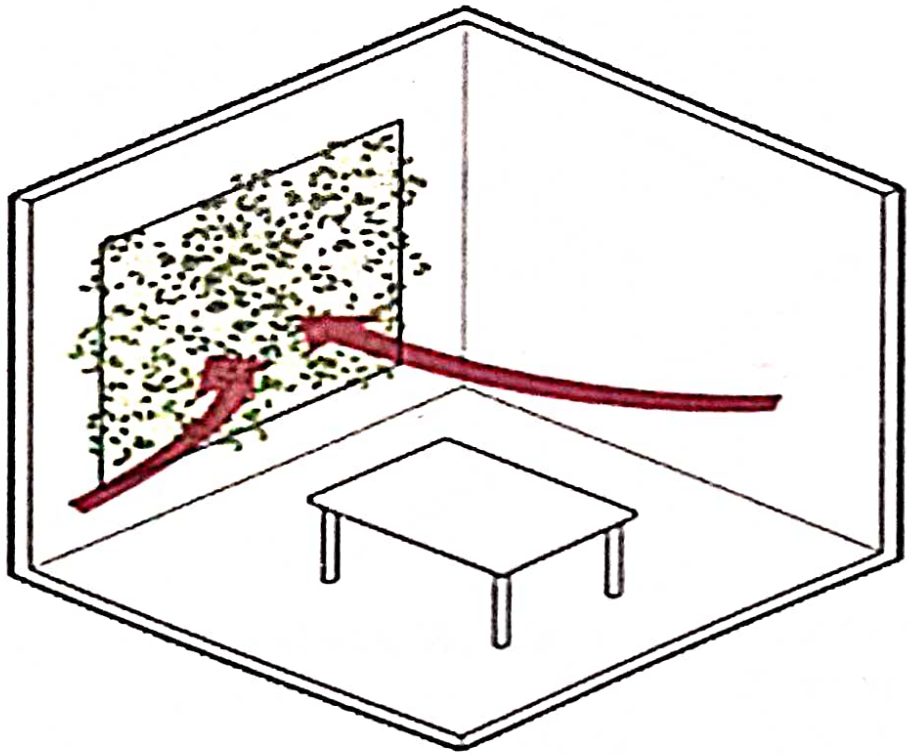
FLOOR PLAN



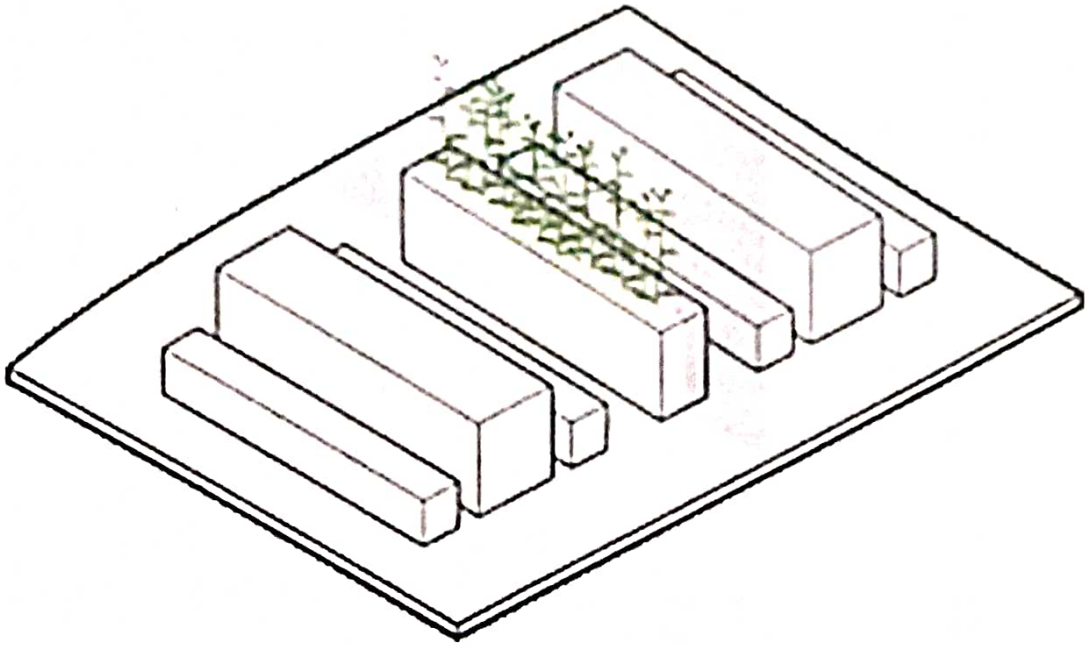
CONCEPT OF VERTICAL FARMING



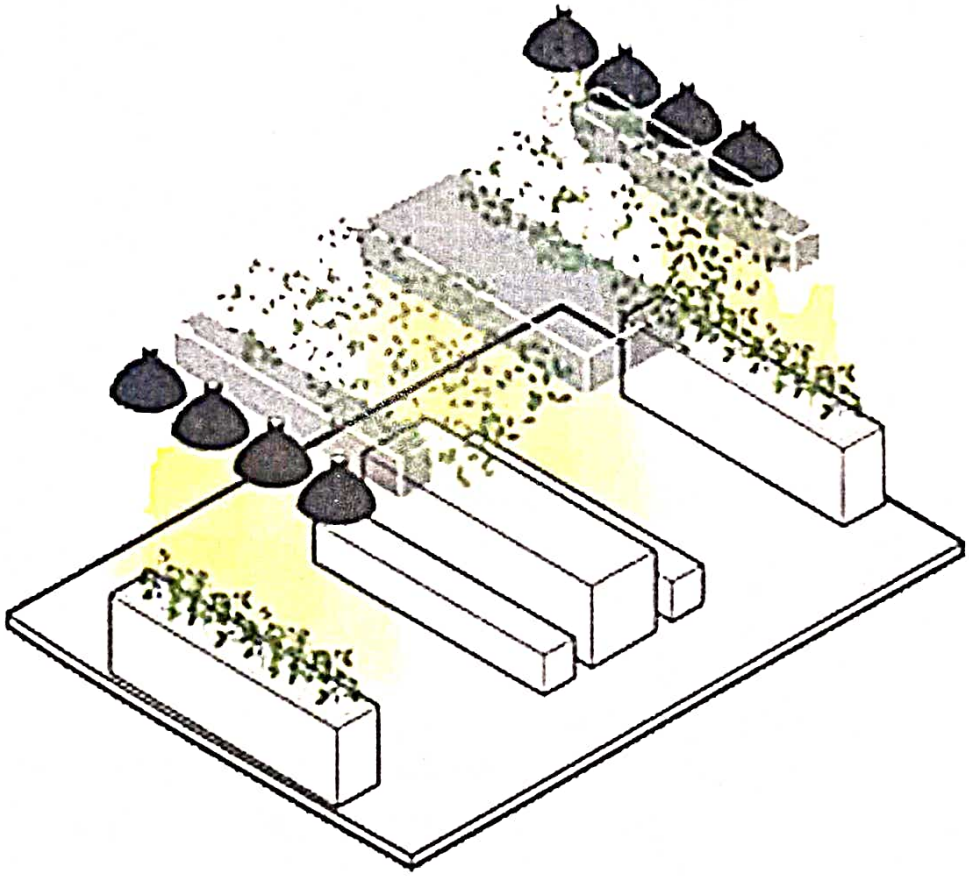
GIVE AN IDENTITY TO PUBLIC



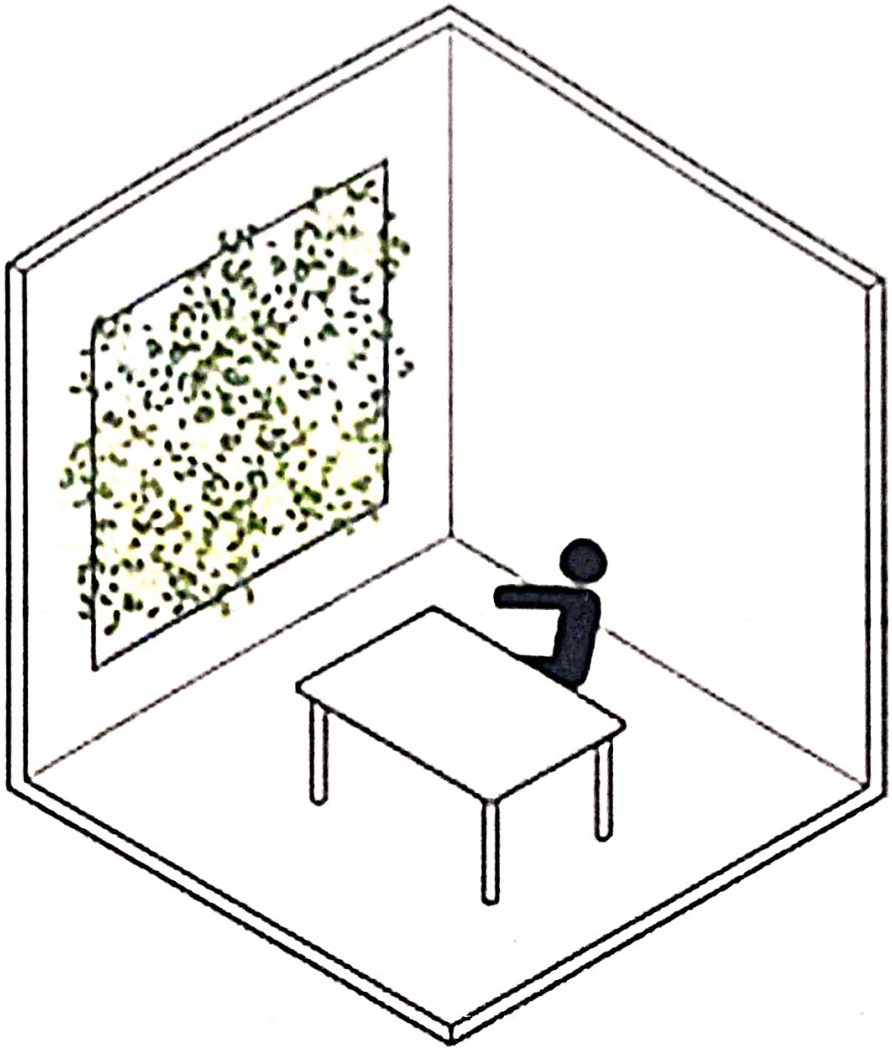
REDUCE HEATING AND COOLING LOAD IN MONSOON



PLANTS ARE USED TO DIVIDE SPACES



THE CROPS ARE EQUIPPED WITHMETAL HALIDE, HEFL FLUORESCENT LED LAMPS USING IT INSTEAD OF SUNLIGHT



PROVIDE BETTER WORKSPACE TO EMPLOYEES

CLIMATE CONTROL SYSTEM

MANUALLY OPERABLE WINDOWS CREATE A THERMAL CHIMNEY. THIS CAUSES PRESSURE DIFFERENCE AND THEREFORE ENABLES AIR CIRCULATION IN THE APARTMENTS AND PUBLIC AREAS, SUCKING THE HOT AIR OUT OF THE BUILDING AND ALLOWING COOLER FRESH AIR INSIDE.

CASE STUDY 1

TWO HORIZON CENTER, GOLF COURSE ROAD, DLF PHASE 5, SECTOR 43, GURGAON

CLIMATIC CONDITIONS

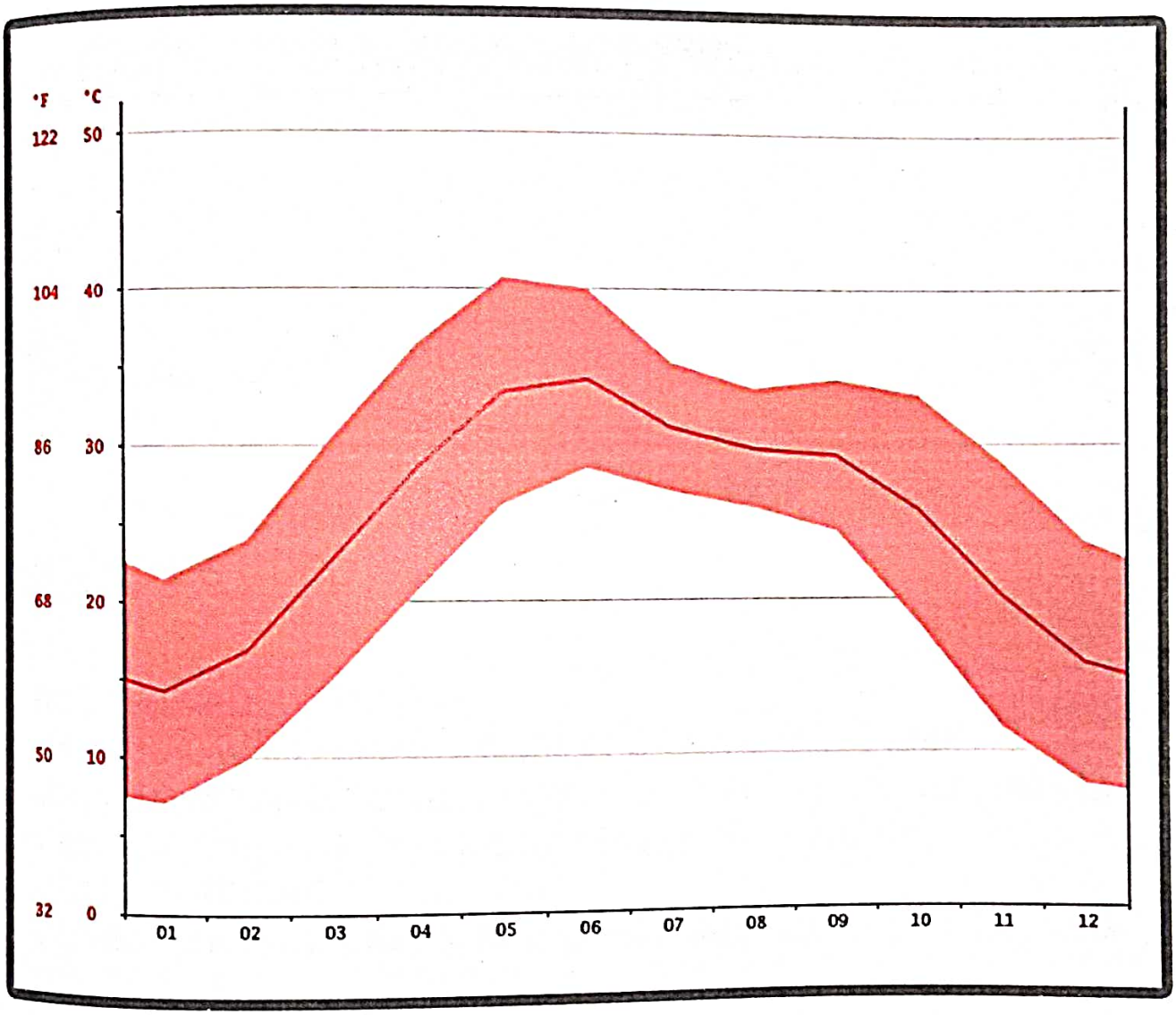
THE PREVAILING CLIMATE IN GURGAON IS KNOWN AS A LOCAL STEPPE CLIMATE. THERE IS LITTLE RAIN FALL THROUGHOUT THE YEAR. THIS CLIMATE IS CONSIDERED TO BE BSH ACCORDING TO THE KOPPEN-GEIGER CLIMATE CLASSIFICATION. THE TEMPERATURE HERE AVERAGES 25.2 °C. PRECIPITATION HERE AVERAGES 618MM.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	14.3	16.9	22.7	28.6	33.4	34.2	31.1	29.7	29.3	25.8	20.2	15.8
Min. Temperature (°C)	7.1	9.9	15	20.7	26.2	28.5	27	25.9	24.4	18.4	11.6	7.9
Max. Temperature (°C)	21.5	24	30.5	[illegible]	40.7	40	35.3	33.6	34.2	33.2	28.9	23.7
Avg. Temperature (°F)	57.7	62.4	72.9	[illegible]	92.1	93.6	88.0	85.5	84.7	78.4	68.4	60.4
Min. Temperature (°F)	44.8	49.8	59.0	[illegible]	79.2	83.3	80.6	78.6	75.9	65.1	52.9	46.2
Max. Temperature (°F)	70.7	75.2	86.9	[illegible]	105.3	104.0	95.5	92.5	93.6	91.8	84.0	74.7
Precipitation / Rainfall (mm)	16	10	9	5	8	34	188	200	115	27	3	3

THE CITY EXPERIENCES FOUR DISTINCT

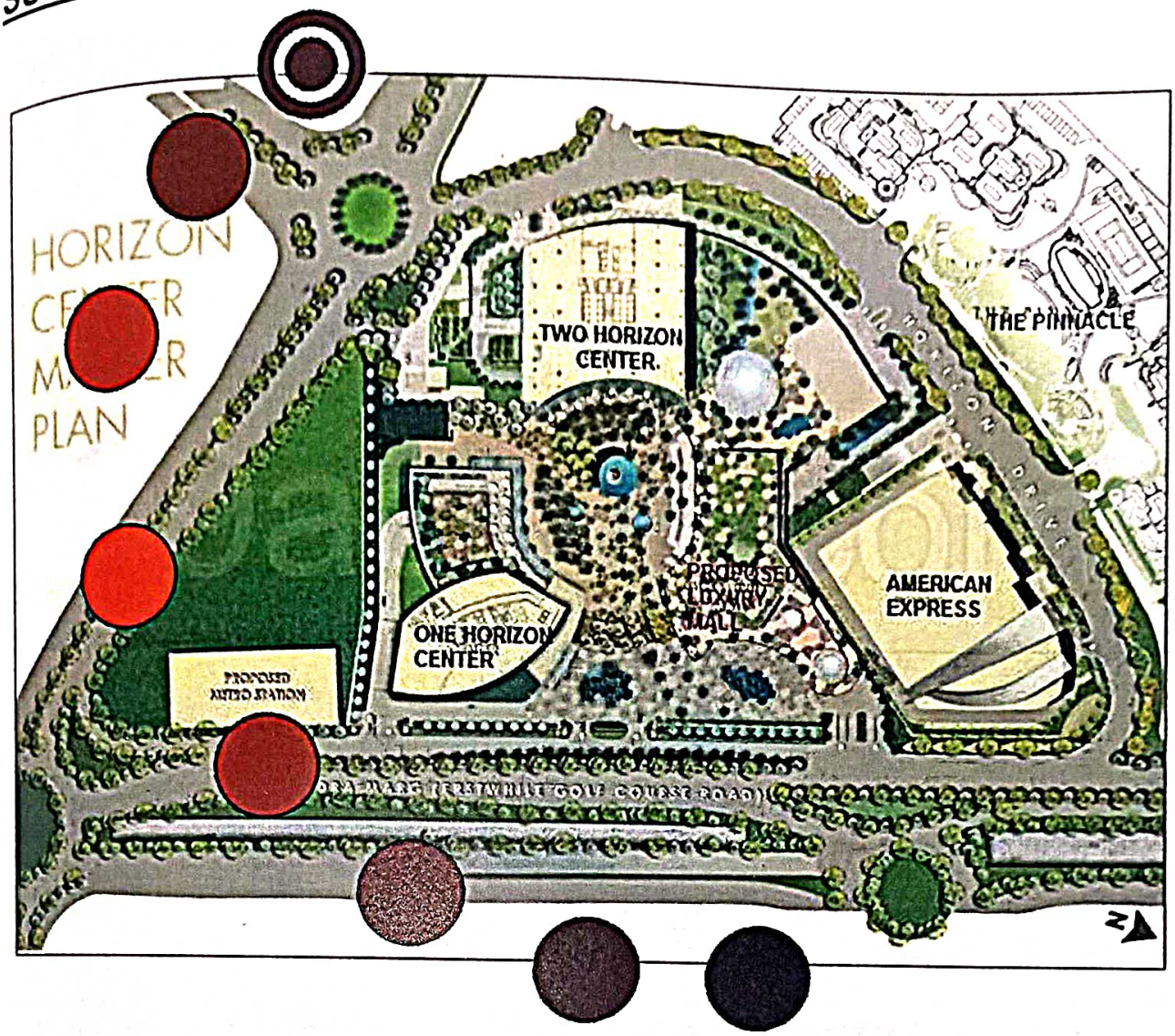
1. SEASONS - SPRING (FEBRUARY - MARCH).
2. SUMMER (APRIL - AUGUST)
3. FALL/AUTUMN (SEPTEMBER - OCTOBER).
4. WINTER (NOVEMBER - JANUARY).
5. ALONG WITH THE MONSOON SEASON SETTING IN TOWARDS THE LATTER HALF OF THE SUMMER. SUMMERS, FROM EARLY APRIL TO MID-OCTOBER, ARE TYPICALLY HOT AND HUMID, WITH AN AVERAGE DAILY JUNE HIGH TEMPERATURE OF 40 °C (104 °F).

THE SEASON EXPERIENCES HEAT INDICES EASILY BREAKING 43 °C (109 °F). WINTERS ARE COLD AND FOGGY WITH FEW SUNNY DAYS, AND WITH A DECEMBER DAYTIME AVERAGE OF 3 °C (37 °F). THE WESTERN DISTURBANCE BRINGS SOME RAIN IN WINTERS THAT FURTHER ADDS TO THE CHILL. SPRING AND AUTUMN ARE MILD AND PLEASANT SEASONS WITH LOW HUMIDITY. THE MONSOON SEASON USUALLY STARTS IN THE FIRST WEEK OF JULY AND CONTINUES TILL AUGUST. THUNDERSTORMS ARE NOT UNCOMMON DURING THE MONSOON. THE AVERAGE ANNUAL RAINFALL IS APPROXIMATELY 714 MILLIMETRES (28.1).



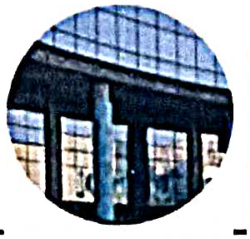
WITH AN AVERAGE OF 34.2 °C, JUNE IS THE WARMEST MONTH. THE LOWEST AVERAGE TEMPERATURES IN THE YEAR OCCUR IN JANUARY, WHEN IT IS AROUND 14.3 °C

SUN PATH



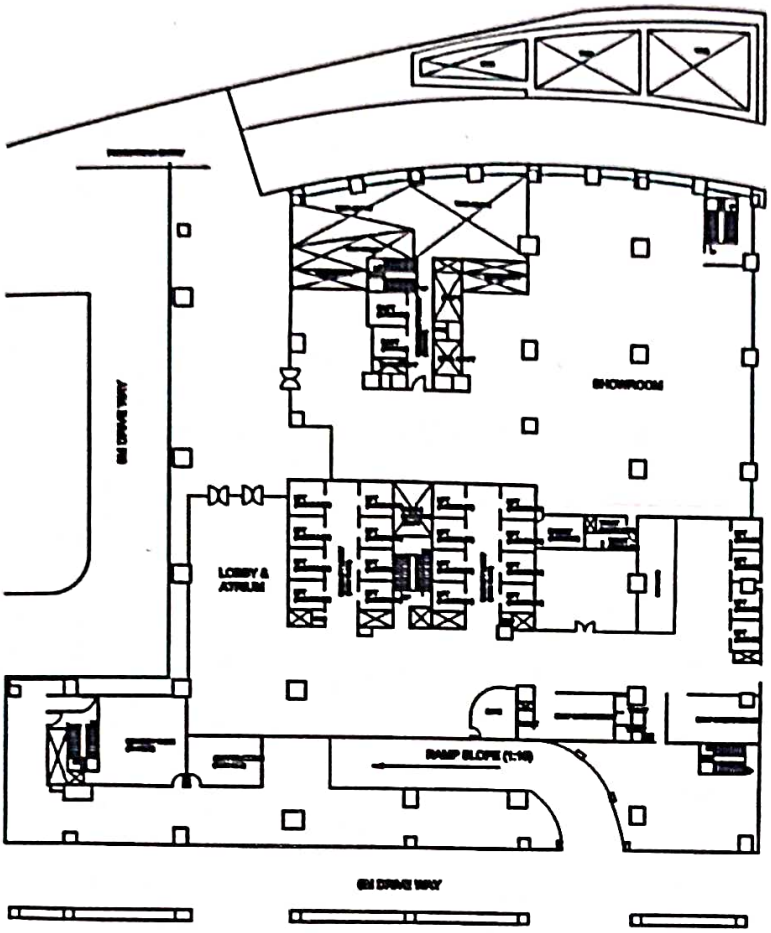
MATERIALS USED

1. RCC FRAMED STRUCTURE.
2. EXTERNAL WALLS STRUCTURE GLAZING WITH CLEAR INSULATED DOUBLE GLAZED VISION UNIT WITH LOW -E COATING ON SURFACE WITH STONE 3.COATING WITH GRANITE.
4. METAL CLADDING.
5. COMBINATION OF INDIAN AND OTHER MARBLE GRANITES, AND VITRIFIED TILES.

FLOOR PLANS

GROUND FLOOR

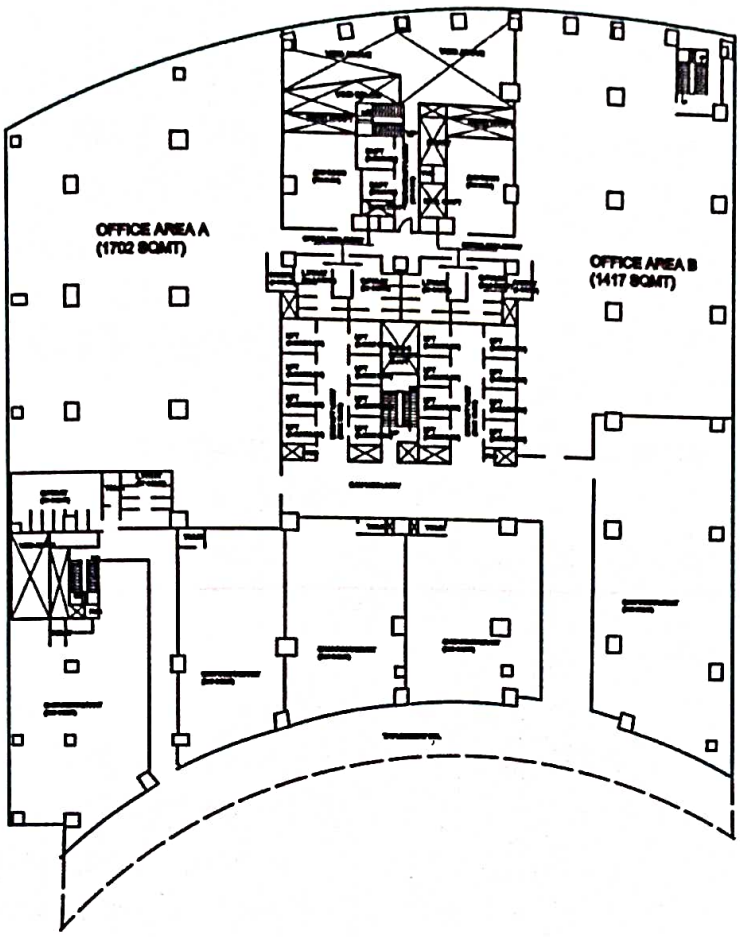


AREAS

TOWER:

1.ENTRANCE LOBBY	(20 SQMT).
2.AHU ROOM	(31.5 SQMT).
3.S.LIFT LOBBY	(27 SQMT).
4.S.LIFT	(10.5 SQMT).
5.S.LIFT	(9 SQMT).
6.STAIRCASE	(13.5 SQMT).
7.LIFTS (16) (EACH)	(10.8 SQMT).
8.MAIN LIFT LOBBY	(40 SQMT).
9.SHOWROOM	(750 SQMT).
10.LOBBY & ATRIUM	(68.3 SQMT).
11.ELECTRIC SHAFT	(8.3 SQMT).
12.ELECTRIC SHAFT	(4.6 SQMT).
13.HVAC	(10 SQMT).
14.HVAC & PLUMBING SHAFT	(18 SQMT).
15.SHOPS AND CAFE	(94 SQMT).
16.SHOPS & REST.	(33 SQMT).
17.SHOPS & REST.	(40 SQMT).
18.SECURITY CABIN	(70 SQMT).
19.VOID	(160 SQMT)

FIRST FLOOR



AREAS

TOWER:

1.S.LIFT LOBBY	(27 SQMT).
2.S.LIFT	(10.5 SQMT).
3.S.LIFT	(9 SQMT).
4.STAIRCASE	(13.5 SQMT).
5.LIFTS (16) (EACH)	(10.8 SQMT).
6.MAIN LIFT LOBBY	(40 SQMT).
7.AHU ROOM	(63 SQMT).
8.ELECTRIC SHAFT	(8.3 SQMT).
9.ELECTRIC SHAFT	(4.6 SQMT).
10.HVAC	(10 SQMT).
11.HVAC & PLUMBING SHAFT	(18 SQMT).
12.VOID	(160 SQMT).
13.OFFICE AREA A	(1702 SQMT).
14.OFFICE AREA B	(1417 SQMT).
15.PANTRY	(8 SQMT).
16.LADIES AFCILITIES	(24.6 SQMT).
17.MALE FACILITIES	(24.6 SQMT).
18.SHOP&REST.	(445 SQMT).
19.SHOP&REST.	(235 SQMT).
20.SHOP&REST.	(215 SQMT).
21.SHOP&REST.	(215 SQMT).
22.SHOP&REST.	(283 SQMT).

AREA ANALYSIS

PLOT AREA = 64731 SQMT. (1.ONE HORIZON CENTER
2. TWO HORIZON CENTER 3.AMERICAN EXPRESSES).
(3134+4601+9742)=17477 SQMT.
GROUND COVERAGE = 27%.
F.A.R = 1.7
GROUND COVERAGE = (64731 X 27)/100
= 17477.3SQMT.
ACCORDING TO THE NORMS HEIGHT IS UNRESTRICTED
THEREFORE BUILT UP = 110425 SQMT.
TOTAL NO. OF FLOORS = BUILT UP / GROUND COVERAGE.
= 110425 / 4601 SQMT.
= 24
TOTAL AREA OF THE BASEMENT = 4601 SQMT.
ACCORDING TO THE NORMS OF DEVELOPEMNET AUTHORITY:
MAXIMUM F.A.R COULD BE REACHED UPTO = 175%.
MAXIMUM BUILDING HEIGHT = UNRESTRICTED.
MAXIMUM BASEMENT = UNRESTRICTED.
MAXIMUM GROUND COVERAGE = 60%.
AND ACCORDING TO NORMS FOR BASEMENT PARKING

1ECS = 32 SQMT.
TOTAL AREA OF THE BASEMENT = 4601 SQMT.
HENCE NO. OF CARS =4601 / 32
=143 CARS
HENCE NO. OF BASEMENT IN UNITECH BUSINESS PARK IS FOUR.
THEREFORE NO OF CARS =4 X 143.
= 575 CARS.

(ii) Commercial

Sr. no.	Type of building	Area norm	Maximum permissible Ground Coverage	Permissible Basement	Maximum permissible Floor Area Ratio (FAR)	Maximum permissible Height
1	Shop-cum-Flat (SCF) or Shop-cum-Office (SCO) or Shop-cum-Office-cum-Flat (SCOF) or Double Storey Shop (DSS) purposes or for shopping booths	Unrestricted	As per the Architectural Control Sheets			
2	Commercial colony: Includes shopping mall, multiplex, Departmental store, Integrated	Unrestricted	60 %	Unrestricted	175 %	Unrestricted

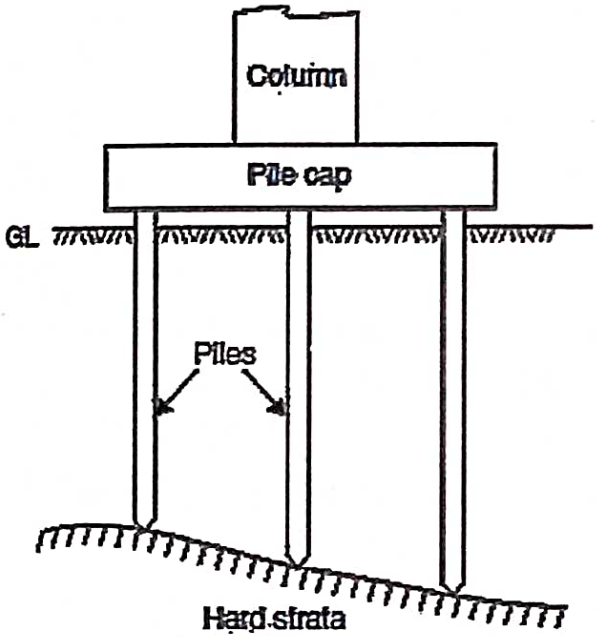
SOIL TYPE

SOIL IS THE BASIC ELEMENT OF ANY PLACE'S GEOGRAPHICAL CHARACTERISTICS.
WE LIVE UPON THE SOIL, SO THE SOIL IS ONE OF OUR BASIC NEEDS.THERE ARE DIFFERENT
KIND OF SOILS.LOAMY SOIL IS ONE OF THE THEM.
THE CHARACTERISTICS OF LOAMY SOIL ARE,
1) THIS KIND OF SOIL IS VERY FERTILE.
2) THIS SOIL CONTAINS DIFFERENT MINERALS AND NUTRIENTS.
3) THIS SOIL HAS GOOD DRAINAGE CAPABILITY.
4) THIS SOIL HAS MEDIUM KIND OF CONSISTENCY.
LOAM SOILS GENERALLY CONTAIN MORE NUTRIENTS, MOISTURE, AND HUMUS THAN SANDY SOILS, HAVE BETTER DRAINAGE AND INFILTRATION OF WATER AND AIR THAN SILTY SOILS, AND ARE EASIER TO TILL THAN CLAY SOILS.

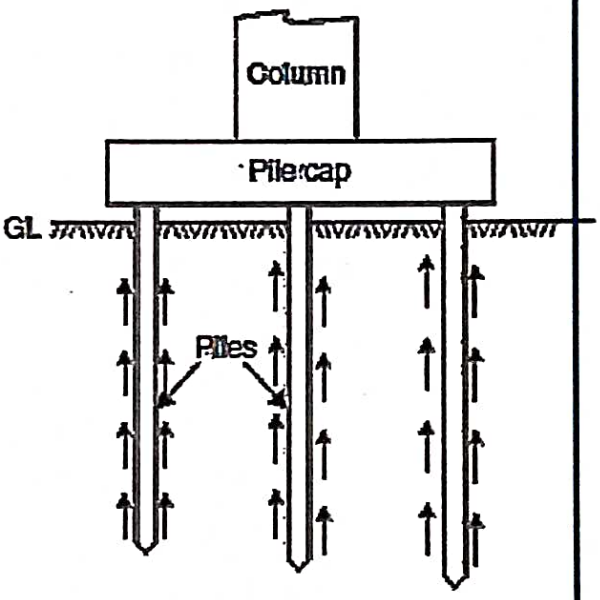
THE TECHNICAL DEFINITION OF LOAM SOIL IS:
1. LESS THAN 52% SAND
2. BETWEEN 28-50% SILT
3.7-27% CLAY
THE BEARING CAPACITY OF LOAMY SOIL IS (80-160) KN/SQMT.
HENCE THE FOUNDATION REFERS FOR THE LOAMY SOIL IS PILE FOUNDATION.
AND SO THAT OF THIS BUILDING (UNITECH BUSINESS PARK).

LOAMY SOIL

DEPENDING UPON THE SOIL TYPE UNITECH BUSINESS PARK HAD BEARING PILE .IN WHICH THE BASE OF FOUNDATION REST OVER THE HARD STRATA, AND THE LOAD FROM THE COLUMN IS TRANSFER FROM THESE PILES TO THE ROCK BED.



(a) Bearing pile



(b) Friction pile

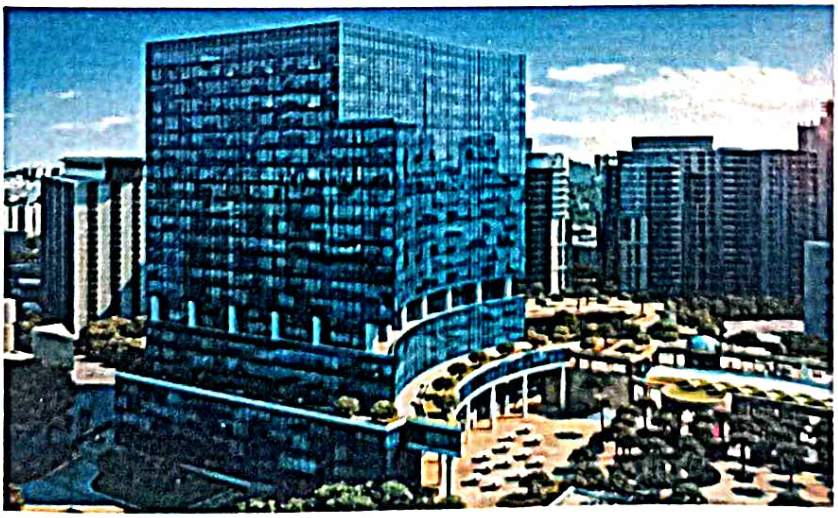
BUILDING DATA

1. STRUCTURE: RCC FRAMED STRUCTURE.
2. ELEVATORS: HIGH SPEED PASSENGER ELEVATORS SERVICES ELEVATOR.
3. PARKING BASEMENT MULTI LEVE PARKING.
4. AMENITIES: CENTRALLY AIR CONDITIONED BUILDING-PROVISION FOR OFFICES AREA AIR CONDITIONING PROVIDED UPTO AHU ON EACH FLOOR. THE INTERNAL DISTRIBUTIONSYSTEM OF AIR

CONDITIONING SHALL BE SOLE RESPONSIBILTIES OF THE TENANT.

5. POWER BACKUP: BACK UP POWER EQIVALENT TO ABOUT 6.0 VA PER SQFT.(0.006 KVA PER SQFT.) OF THE SUPER AREA)

6.FIRE FIGHTING:SPRINKLER AND FIRE DETECTION SYSTEM WILL BE PROVIDED IN THE BASEMENT AREA AND COMMON AREA ONLY AS PER NBC FOR FIRE FIGHTING AND SPRINKLER SERVICES IN OFFICE AREA, PROVISION WILL BE MADE UPTO SERVICES SHAFT ON EACH FLOOR SHUTTERS WILL BE PROVIDED.
7. ELECTRICITY / TELEPHONE: PROVISION ON EACH FLOOR UPTO THE SHAFT, CONNECTIONS HAVE TO BE ARRANGED BY RESPECTIVE OWNERS / USERS.NO ELECTRIC CONDUITS OR WIRING SHALL PROVIDED IN THE SLAB.
8. FLOOR TO FLOOR HEIGHT: THE FLOOR TO FLOOR HEIGHT IN THE BUILDING IS ESTIMATED TO BE 4.2MYS FOR TYPICAL FLOOR.
9. LEED CERTIFIED: LEED CERTIFIED GREEN BUILDING.



CASE STUDY 2

UNITECH BUSINESS PARK

LOCATION

Sector 17-B, Block F, South City I, Sector 41, Gurugram, Haryana 122002

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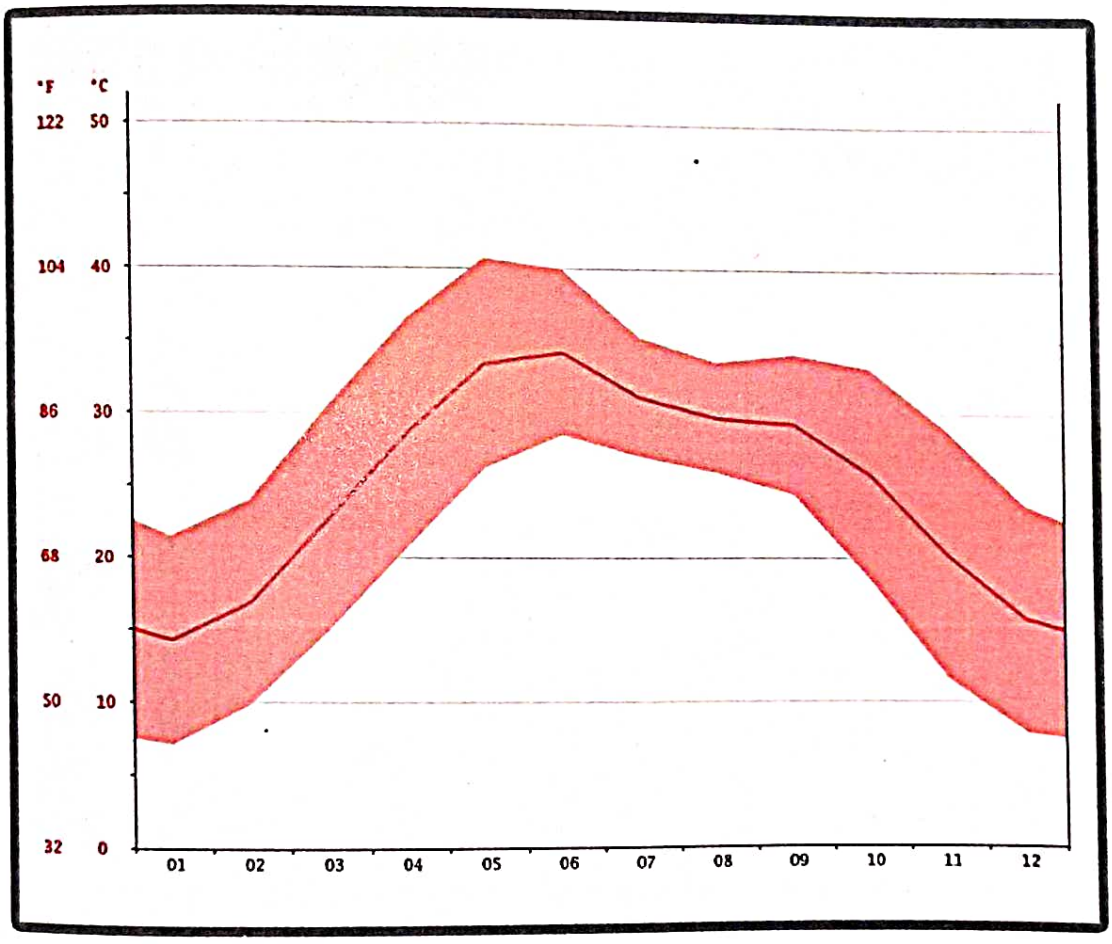
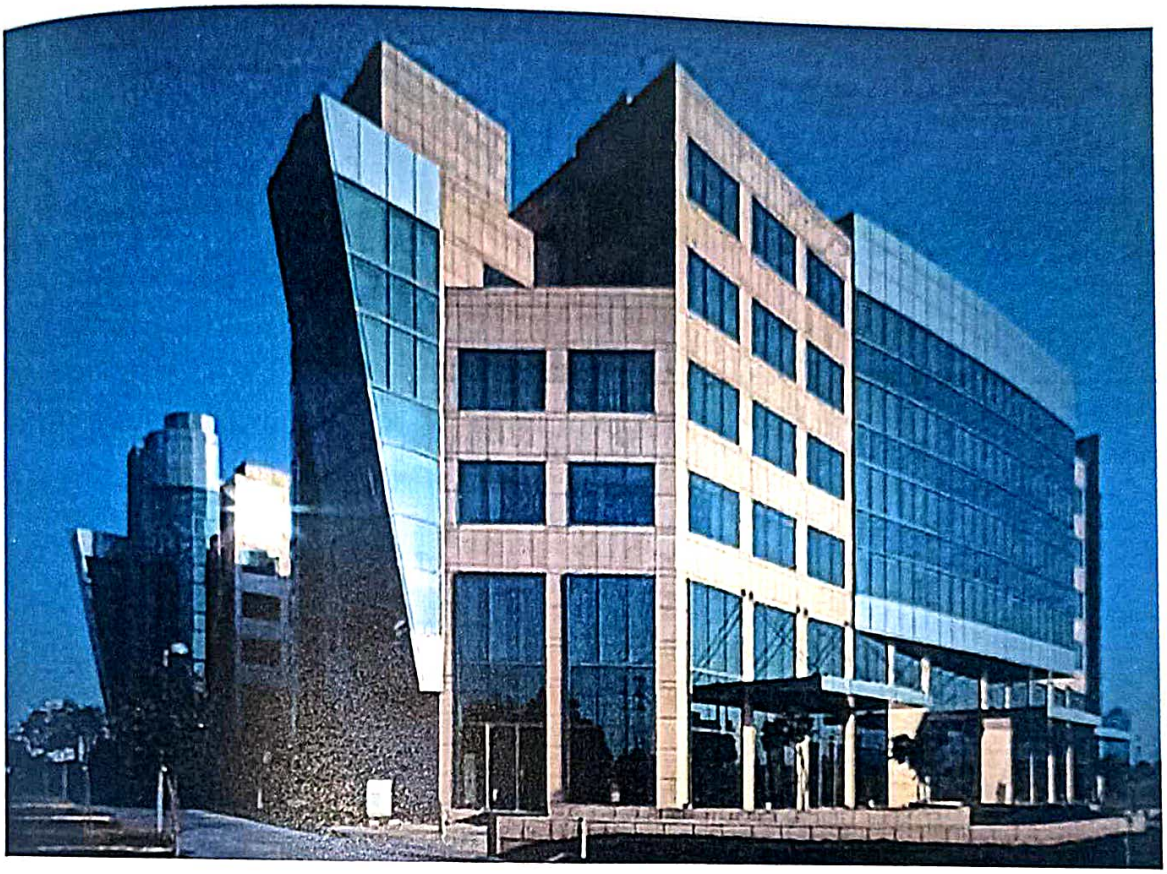


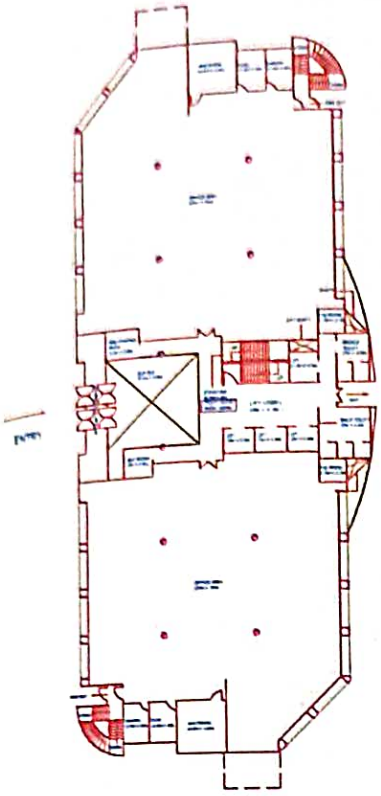
MATERIAL USED

1. HEAT REFLECTIVE GLASS
2. STONE.
3. METAL PANELS.
4. FLAT ROOFING (RCC).

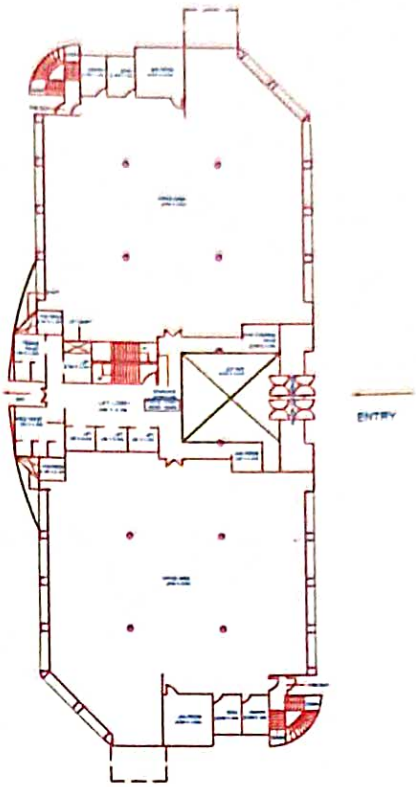


FLOOR PLANS

GROUND FLOOR

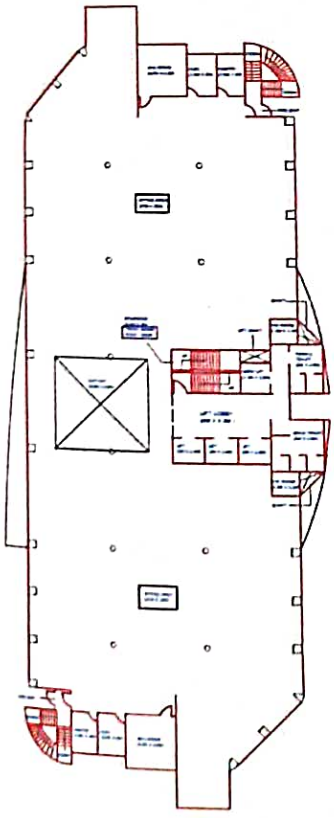


TOWER A

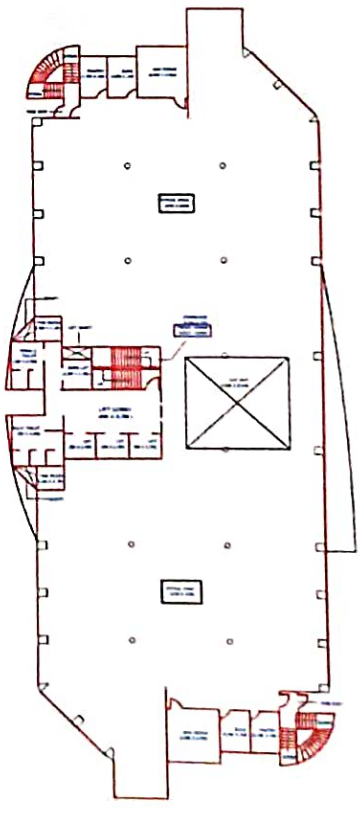


TOWER B

FIRST FLOOR

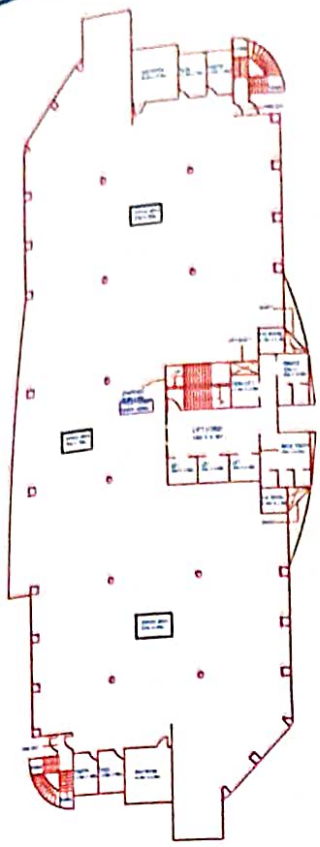


TOWER A

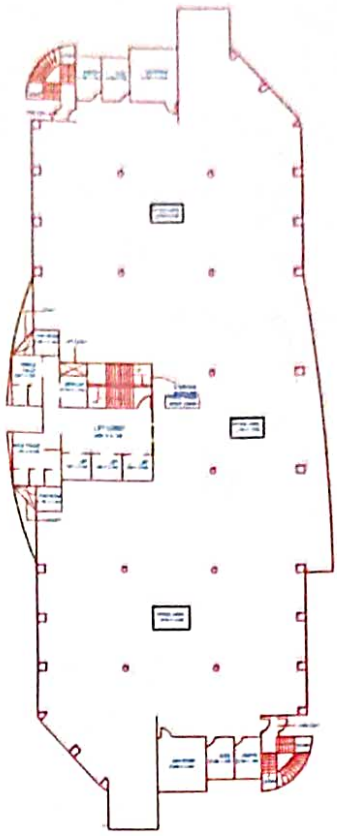


TOWER B

SECOND FLOOR

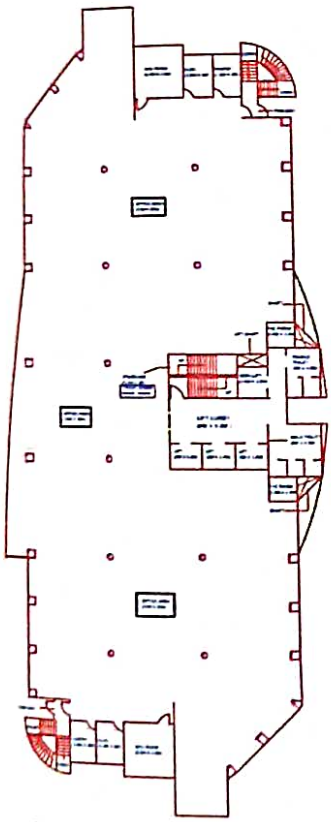


TOWER A

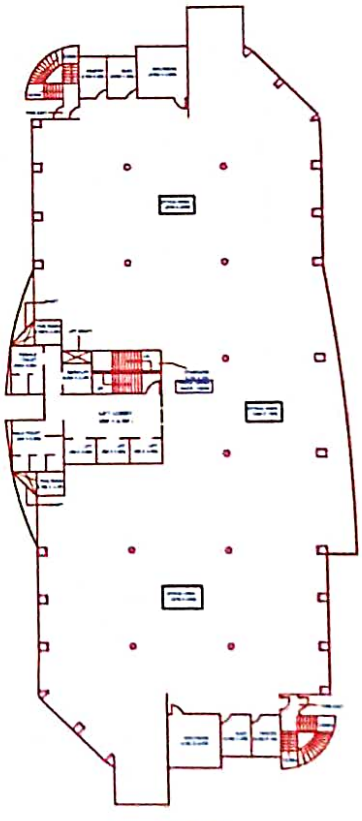


TOWER B

THIRD FLOOR

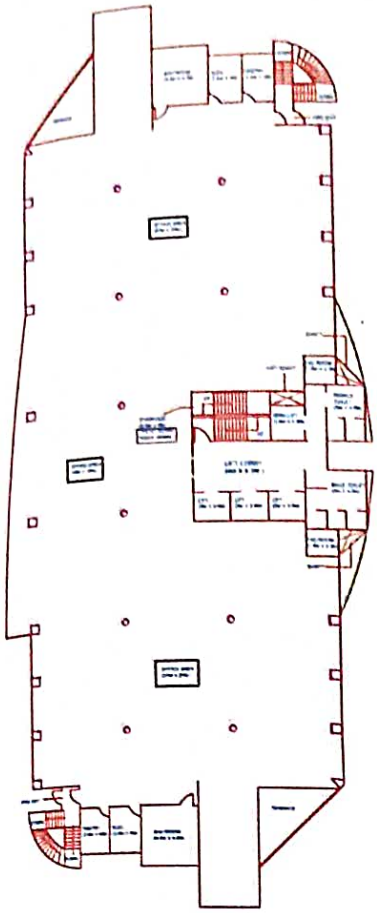


TOWER A

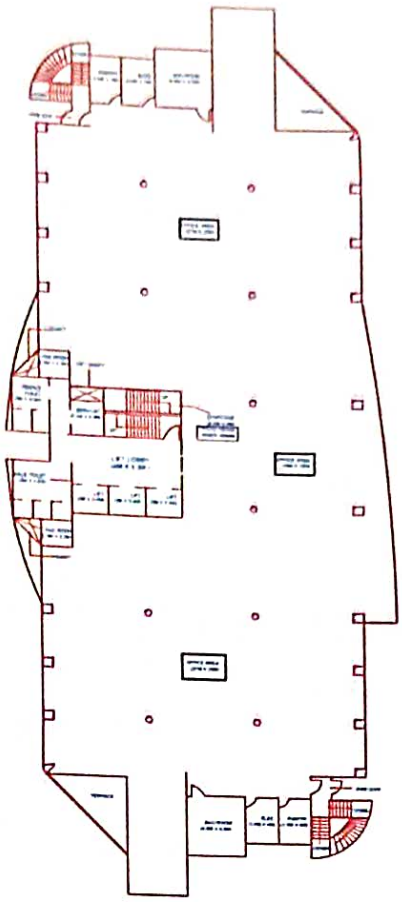


TOWER B

FOURTH FLOOR

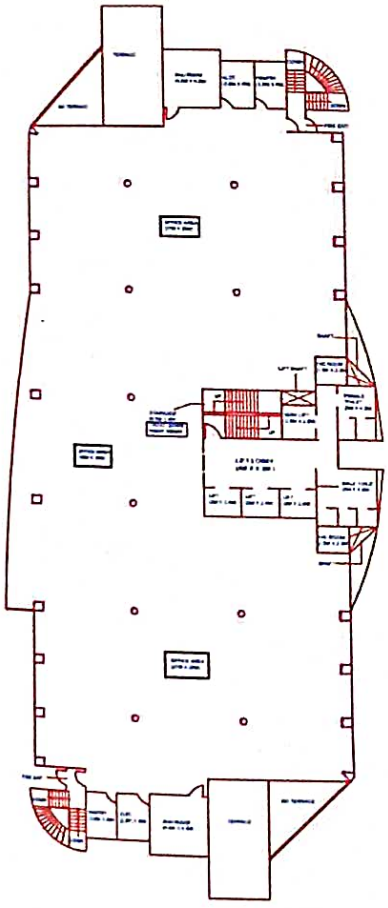


TOWER A

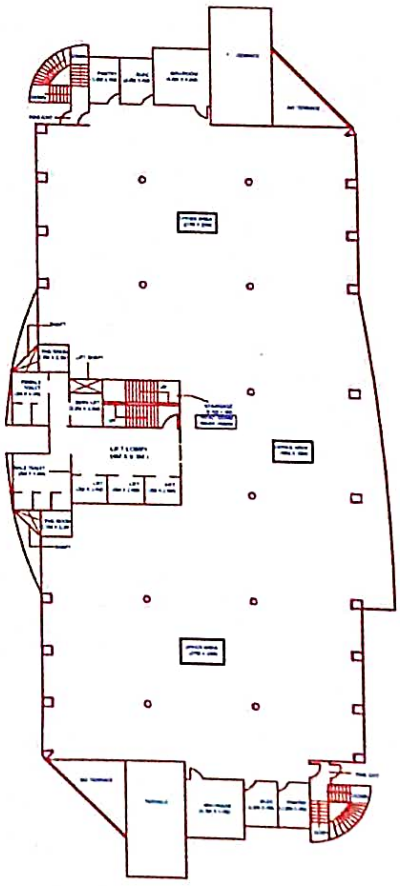


TOWER B

FIFTH FLOOR



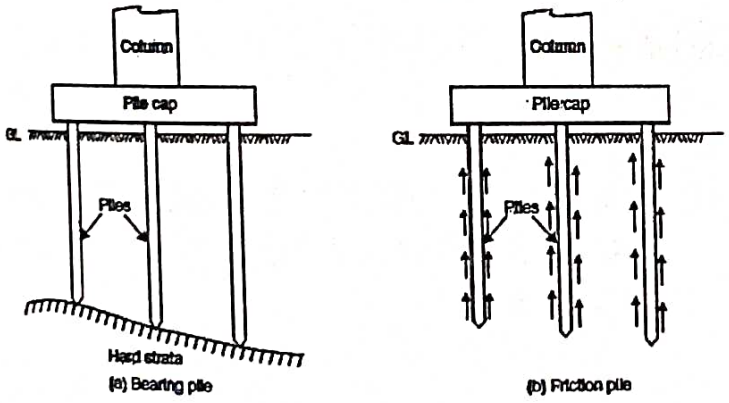
TOWER A



TOWER B

SOIL TYPE

SOIL IS THE BASIC ELEMENT OF ANY PLACE'S GEOGRAPHICAL CHARACTERISTICS.
WE LIVE UPON THE SOIL, SO THE SOIL IS ONE OF OUR BASIC NEEDS.THERE ARE DIFFERENT
KIND OF SOILS.LOAMY SOIL IS ONE OF THE THEM.
THE CHARACTERISTICS OF LOAMY SOIL ARE,
1) THIS KIND OF SOIL IS VERY FERTILE.
2) THIS SOIL CONTAINS DIFFERENT MINERALS AND NUTRIENTS.
3) THIS SOIL HAS GOOD DRAINAGE CAPABILITY.
4) THIS SOIL HAS MEDIUM KIND OF CONSISTENCY.
LOAM SOILS GENERALLY CONTAIN MORE NUTRIENTS, MOISTURE, AND HUMUS THAN SANDY SOILS, HAVE BETTER DRAINAGE AND INFILTRATION OF WATER AND AIR THAN SILTY SOILS, AND ARE EASIER TO TILL THAN CLAY SOILS.
THE TECHNICAL DEFINITION OF LOAM SOIL IS:
1. LESS THAN 52% SAND
2. BETWEEN 28-50% SILT
3.7-27% CLAY
THE BEARING CAPACITY OF LOAMY SOIL IS (80-160) KN/SQMT.
HENCE THE FOUNDATION REFERS FOR THE LOAMY SOIL IS PILE FOUNDATION.
AND SO THAT OF THIS BUILDING (UNITECH BUSINESS PARK).



DEPENDING UPON THE SOIL TYPE UNITECH BUSINESS PARK HAD BEARING PILE .IN WHICH THE BASE OF FOUNDATION REST OVER THE HARD STRATA, AND THE LOAD FROM THE COLUMN IS TRANSFER FROM THESE PILES TO THE ROCK BED.

AREA ANALYSIS

PLOT AREA = 8361 SQMT.
GROUND COVERAGE = 33%.
F.A.R = 1.6.

GROUND COVERAGE = (8361 X 33)/100
= 2788SQMT.

BUILT UP = PLOT AREA X F.A.R
= 8361 X 1.6
= 13377.6 SQMT.

TOTAL NO. OF FLOORS = BUILT UP / GROUND COVERAGE.
= 4.7 FLOORS.
= 5 FLOORS.

TOTAL AREA OF THE BASEMENT = 6196.5 SQMT.

ACCORDING TO THE NORMS OF DEVELOPEMNET AUTHORITY:
MAXIMUM F.A.R COULD BE REACHED UPTO = 175%.
MAXIMUM BUILDING HEIGHT = UNRESTRICTED.
MAXIMUM BASEMENT = UNRESTRICTED.
MAXIMUM GROUND COVERAGE = 60%.
AND ACCORDING TO NORMS FOR BASEMENT PARKING
1ECS = 32 SQMT.
TOTAL AREA OF THE BASEMENT = 6196.5 SQMT.
HENCE NO. OF CARS =6196.5 / 32
=194 CARS
HENCE NO. OF BASEMENT IN UNITECH BUSINESS PARK IS TWO.
THEREFORE NO OF CARS =2 X 194.
= 388 CARS.

(n) Commercial

Sr. no.	Type of building	Area norm	Maximum permissible Ground Coverage	Permissible Basement	Maximum Permissible Floor Area Ratio (FAR)	Maximum permissible Height
1	Shop-cum-Flat (SCF) or Shop-cum-Office (SCO) or Shop-cum-Office-cum-Flat (SCOF) or Double Storey Shop (DSS) purposes or for shopping booths	Unrestricted	As per the Architectural Control Sheets			
2	Commercial colony: includes shopping mall, multiplex, Departmental store, Integrated	Unrestricted	60 %	Unrestricted	175 %	Unrestricted

ADVANTAGES

BUILDING DATA
DISTINGUISHED ARCHITECTURAL DESIGN BY ACCLAIMED ARCHITECTS HIGH EFFICIENCY FLOOR PLANS EXTERNAL FACADE, A COMBINATION OF HEAT REFLECTIVE GLASS, STONE AND METAL PANELS DRAMATIC LANDSCAPING IMPRESSIVE ENTRIES AND LOBBIES, FINISHED WITH GRANITE AND MARBLE TENANT AREAS PROVIDED WITH CEMENT/SAND SCREED, READY FOR TENANT'S FLOORING WALLS PLASTERED AND PAINTED.

SYSTEMS

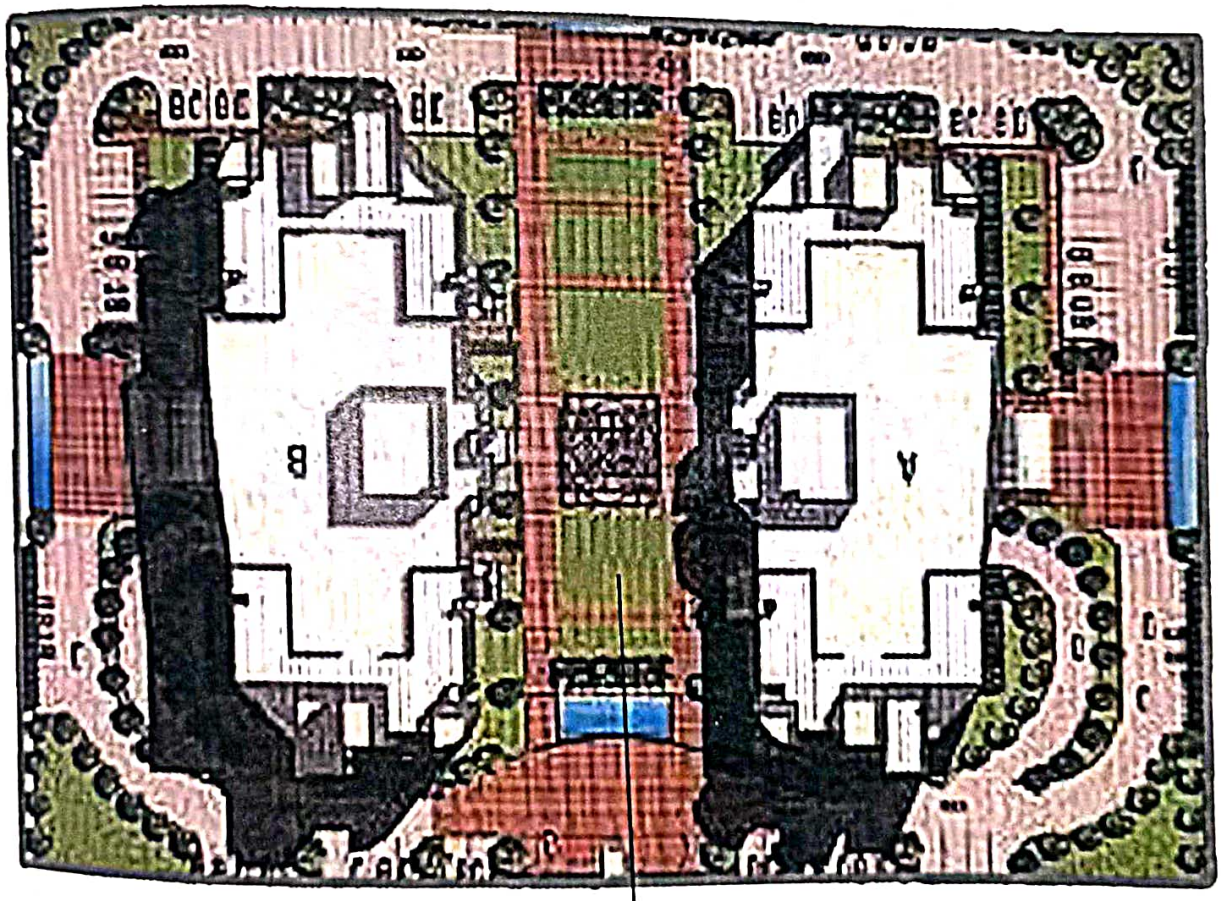
1. INDIVIDUAL DISTRIBUTION BOARDS FOR EACH FLOOR/OFFICE MODULE
2.100% POWER BACKUP
3. PROVISION FOR FIBER OPTIC TELECOMMUNICATIONS
4. FIRE PROTECTION SYSTEM
5. CENTRAL AIR CONDITIONING SYSTEM, AHU LOCATED ON EACH
6.FLOOR FOR TENANT'S DISTRIBUTION SYSTEM
7. SEPARATE PASSENGER AND SERVICE LIFTS TO EACH TOWER
8. PROVISION FOR PUBLIC ADDRESS VOICE COMMUNICATION SYSTEM
9. PROVISION FOR BUILT-IN CONDUITS FOR TENANT'S POWER, DATA AND VOICE DISTRIBUTION

AMENITIES

1. EXTENSIVE BUILDING AND SITE AMENITIES
2. GENEROUS TWIN-LEVEL BASEMENT PARKING GARAGE
3. EXTERIOR TERRACES AND GARDENS
4. AMPLE PUBLIC TRANSPORTATION SERVICES NEARBY FOR EMPLOYEE
5. PROFESSIONAL PROPERTY MANAGEMENT

DIADVANTAGE:

1. PARKING ISSUE ACCORDING TO THE WORKING STRENGTHS OF BOTH THE TOWER'S PARKING SPACE IS LESS.
2. SKYLINE IS DISTURBED BECAUSE OF METRO STATION INFRONT OF THE BUILDING HUDA CITY CENTER METRO STATION.BECAUSE OF THIS THE FRONT FACING OF THE BUILDING IS IN NORTH WEST DIRECTION.



SEATING AREA INTERACTIVE SPACE

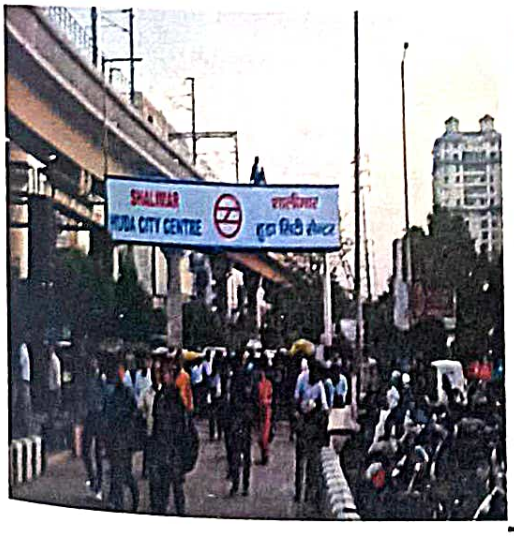
TRANSPORTATIONAL RESOURCES

1. NEAREST PARKING PAID PARKING - 0.4 KM.

2. AIRPORT 18.7 KM TO DOMESTIC AIRPORT
17.6 KM TO INDIRA GANDHI INTERNATIONAL AIRPORT

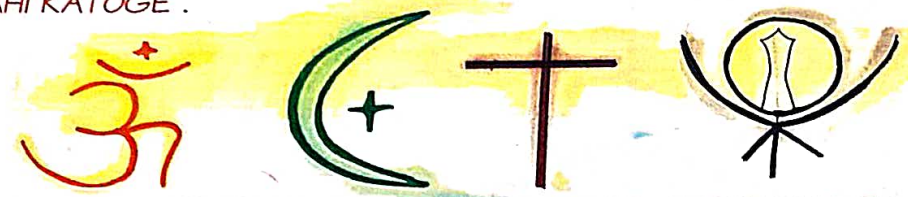
3. HUDA CITY CENTRE METRO STATION - 0.1 KM.

4. HUDA CITY CENTRE METRO STATION - 0.1 KM VIVANTA BY TAJ (5 STAR) - 0.2 KM.



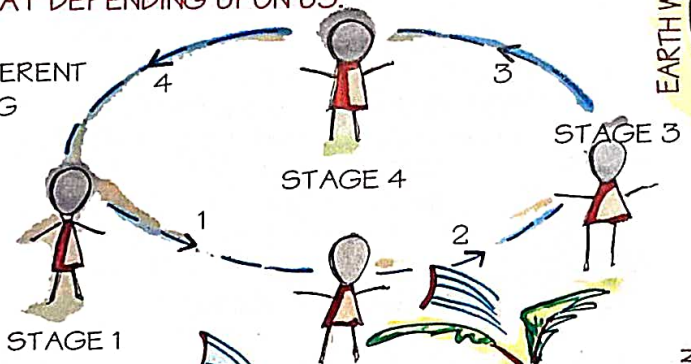
VERTICAL CITY FARM MIXED USED BUILDING [CONCEPT LAYOUT]

THE CONCEPT IS INSPIRED BY A PROVERB "AS YOU SOW, SO SHALL YOU REAP". WHICH MEANS "JAISI KARNI WAISI BHARNI". IN OTHER WORD "JO BOGE WAHI KATOGE".

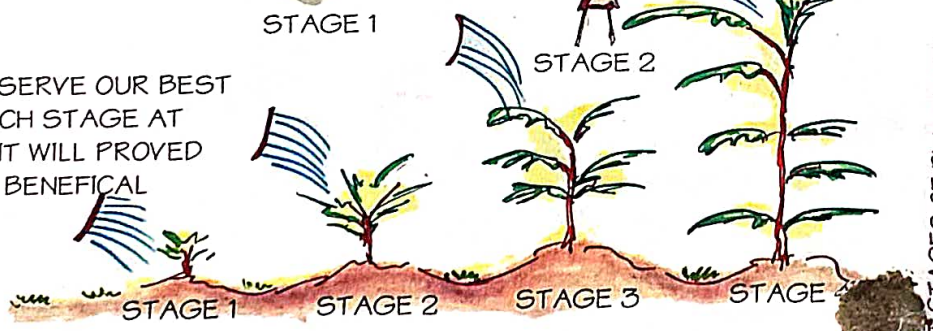


THIS PROVERB IS MENTIONED IN ALL THE RELIGIOUS HOLY BOOK. WHICH MEANS OUR DEEDS IN PRESENT WILL EFFECT OUR FUTURE WHEATHER IN POSITIVE OR NEGATIVE WAY DEPENDING UPON US.

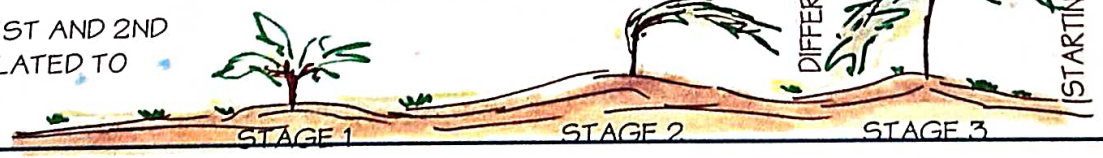
RING OF DEEDS AT DIFFERENT STAGES OF LIFE COMING BACK TO SERVE ITS EFFECT WHEATHER IN POSITIVE OR NEGATIVE WAY DEPENDING UPON US.



IF WE SERVE OUR BEST AT EACH STAGE AT LAST IT WILL PROVED TO BE BENEFICAL



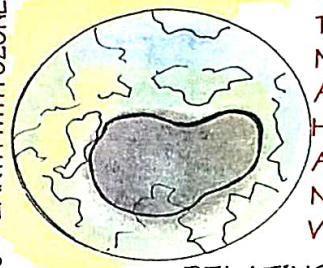
DIFFERENCE AT 1ST AND 2ND COULD BE CO RELATED TO OUR DEEDS.



DIFFERENT STAGES OF PLANTATION

STARTING PT.

EARTH WITH OZONE DEPLETION



RELATION BETWEEN CONCEPT AND THESIS TOPIC

TILL 2030 80% OF THE WORLD POPULATION WILL SHIFT TO URBAN CITIES. NOW BECAUSE OF TRANSPORTATION AND OTHER EFFECTING UNITS OUR OZONE LAYER IS DEPLETING AT A CONSTANT RATE. ACCORDING TO STATS THIS WOULD INCREASE IN FUTURE.

AS OUR POPULATION SHIFTS, THAN TO SERVE THEM FOOD WOULD BE OF GREATE EXPENCES. NOT ONLY OUR DEPLETION RATE INCREASES BUT ALSO OUR BUDGET RATE INCREASES.

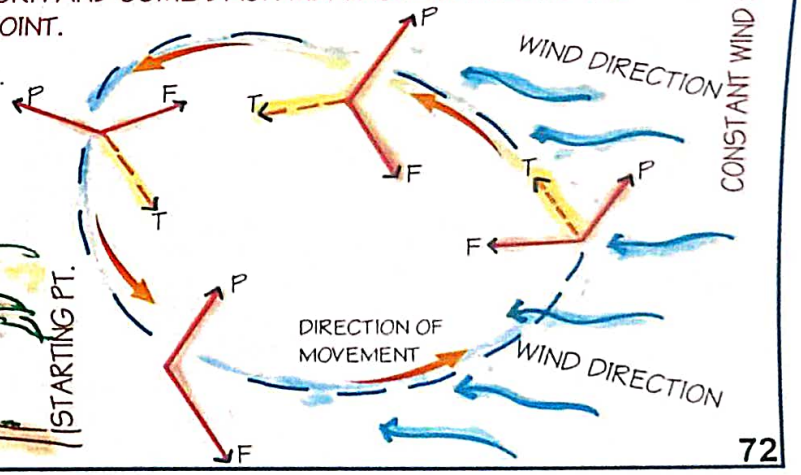
HENCE VERTICAL FARMING CONCEPT IS BEING APPLIED ON THE SITE .

NO TRANSPORTATIONAL COST, HEALTHY ENVIRNOMENT, NEW FACE OF TECHNIQUE.

RELATING THIS CONCEPT WITH PHYSICS CONCEPT

ACCORDING TO PHYSICS CONCEPT AT CONSTANT WIND VELOCITY IF AN OBJECT HAVING WINGS AND ANGLE BETWEEN THE WINGS SHOULD BE OF 120° THAN THE OBJECT WILL EXPERIENCE ANGULAR MOMENTUM AND WILL GAIN ANGULAR VELOCITY AND HENCE TORQUE WILL ACT PERPENDICLAR TO BOTH THE FORCES. HENCE OBJECT TENDS TO TURN AND COME BACK MAKING AND ARC TO THE STARTING POINT.

1. ANGULAR MOMENTUM = P.
2. ANGULAR VELOCITY = V.
3. TORQUE = T.
4. FORCE = F.



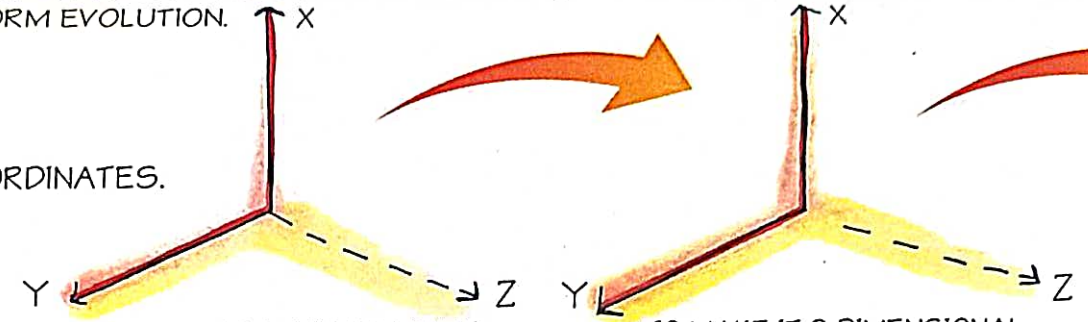
VERTICAL CITY FARM MIXED USED BUILDING [FORM EVOLUTION]

PHYSICS CONCEPT REVOLVES AROUND 3 COORDINATES X-AXIS, Y-AXIS, AND Z-AXIS. IMPLEMENTING THESE THREE COORDINATES INTO MY FORM EVOLUTION.

1. ANGULAR MOMENTUM = P.
2. ANGULAR VELOCITY = V.
3. TORQUE = T.
4. FORCE = F.

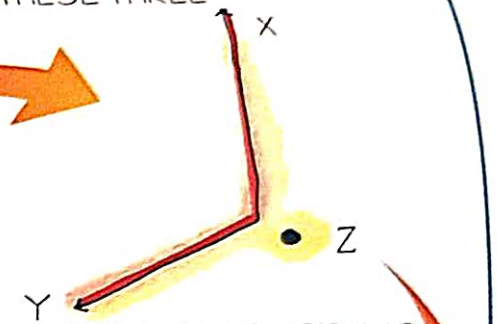
CORELATING IT WITH 3 COORDINATES.

1. X-AXIS= P.
2. Z-AXIS = T.
3. Y-AXIS= F.

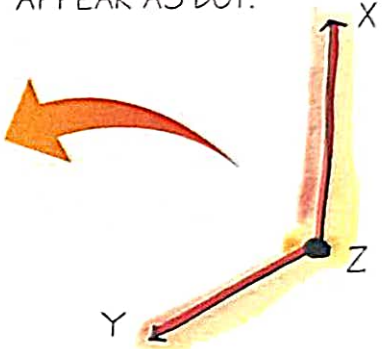


AXISES ARE PERPENDICLUAR TO EACH OTHER

TO MAKE IT 2 DIMENSIONAL VIEW Z-AXISES IS DETACHED

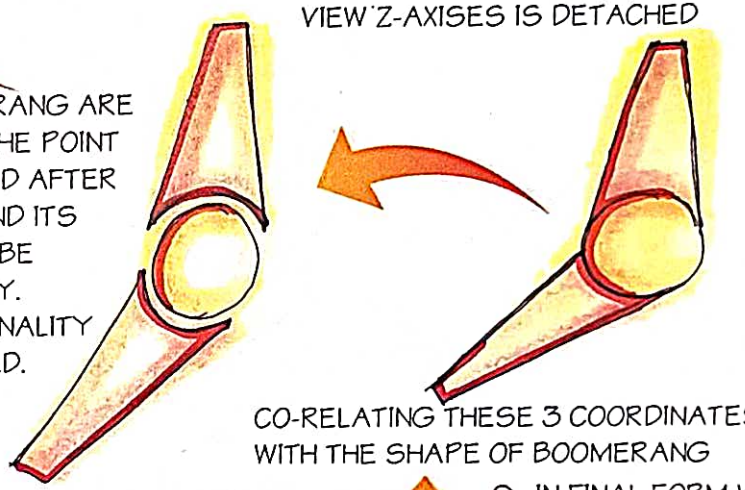


Z-AXISES IS PERPENDICULAR HENCE FROM TOP VIEW IT WILL APPEAR AS DOT.

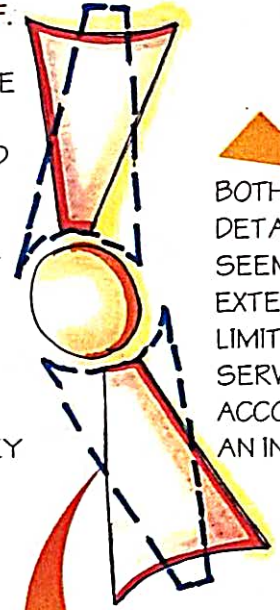


2 DIMENSIONAL POSITIONING OF ALL THE 3 COORDINATES.

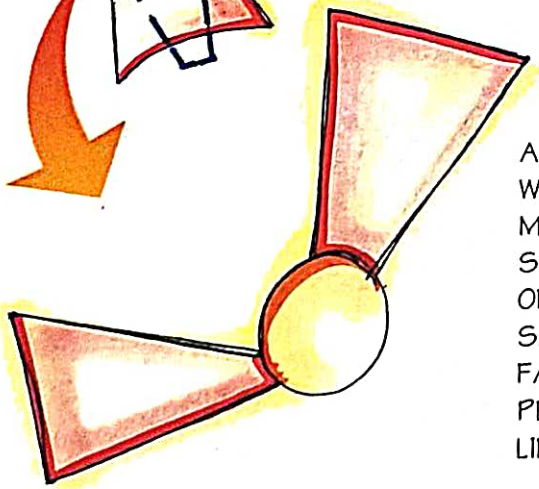
CO-RELATING THESE 3 COORDINATES WITH THE SHAPE OF BOOMERANG



BOTH THE WINGS OF BOOMERANG ARE DETACHED BECAUSE BOTH THE POINT SEEMS TO HAVE POINTED END AFTER EXTENDING THE LINES BEYOND ITS LIMIT. HENCE THIS WOULDN'T BE SERVEING MY FUNCTIONALITY. ACCORDING TO THE FUNCTIONALITY AN INFINTY FORM IS REQUIRED.



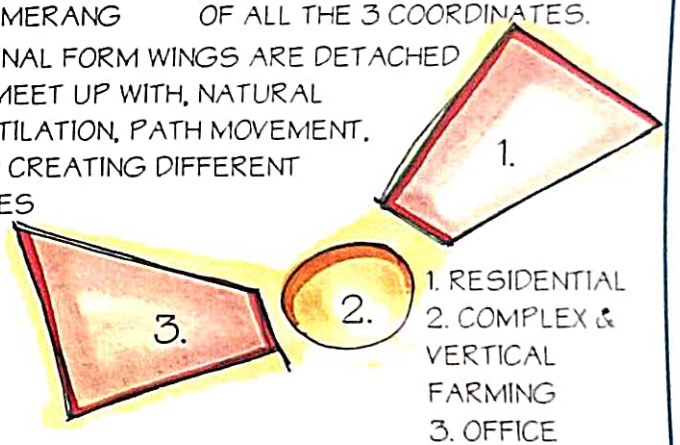
WINGS ARE ROTATED HENCE END WILL NOT MEET AT ONE POINT RATHER THAN MEETING AT ONE POINT THEY MEET AT INFINTY.



AFTER ROTATION EDGES OF THE WINGS SEEMED TO HAVE AN INFINITY MEETING POINT HENCE THIS FORM SERVES THE SAME FUNCTIONALITY AS OF MY PROJECT AS MY PROJECT SAYS OF HAVING A VERTICAL FARMING CONCEPT TO SERVE THE PEOPLE LIVING NEAR BY AREAS FOR LIFE LONG.

FORM EVALUATED

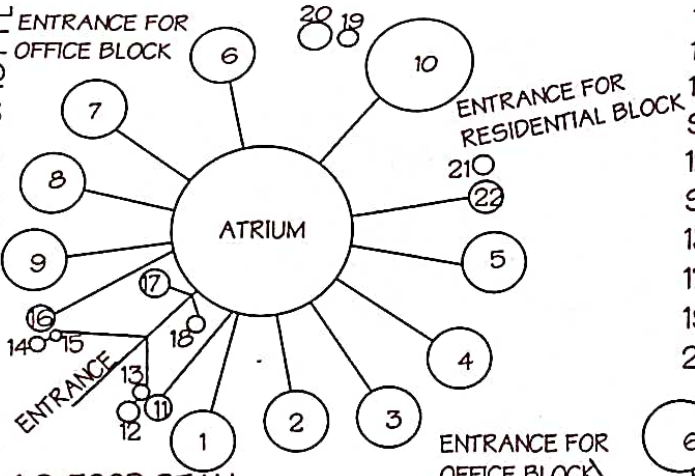
IN FINAL FORM WINGS ARE DETACHED TO MEET UP WITH, NATURAL VENTILATION, PATH MOVEMENT, AND CREATING DIFFERENT ZONES



1. RESIDENTIAL
2. COMPLEX & VERTICAL FARMING
3. OFFICE

VERTICAL CITY FARM MIXED USED BUILDING [VERTICAL STACKING]

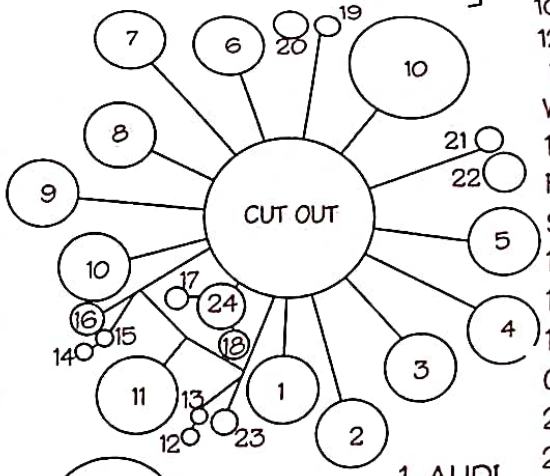
COMPLEX GROUND FL & 1ST FL



1-9. FOOD STALL.
10. TOILET(M/F).
12 & 14. PRIVATE ENTRY FOR LAB SECTION LIFT.
16 & 23. PRIVATE ENTRY FOR LAB SECTION WITH STAIR CASE.
13 & 15. LIFT LOBBY.
17 & 18. PUBLIC LIFT.
19 & 21 PUBLIC STAIR CASE.
20 & 22. AHU ROOM.
24. LIFT LOBBY.

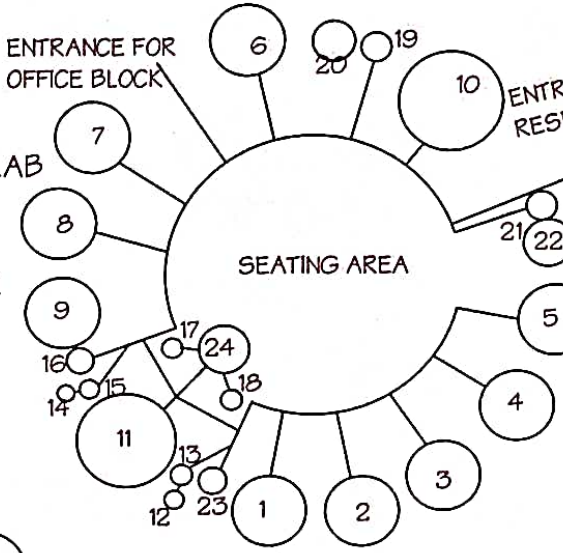
1-9. RETAIL SHOP.
10. TOILET(M/F).
11 & 16. PRIVATE ENTRY FOR LAB SECTION THROUGH STAIR CASE.
12 & 14. PRIVATE ENTRY FOR LAB SECTION WITH STAIR CASE.
13 & 16. LIFT LOBBY.
17 & 18. PUBLIC LIFT.
19 & 21 PUBLIC STAIR CASE.
20 & 22. AHU ROOM.

COMPLEX 2ND AND 3RD FL

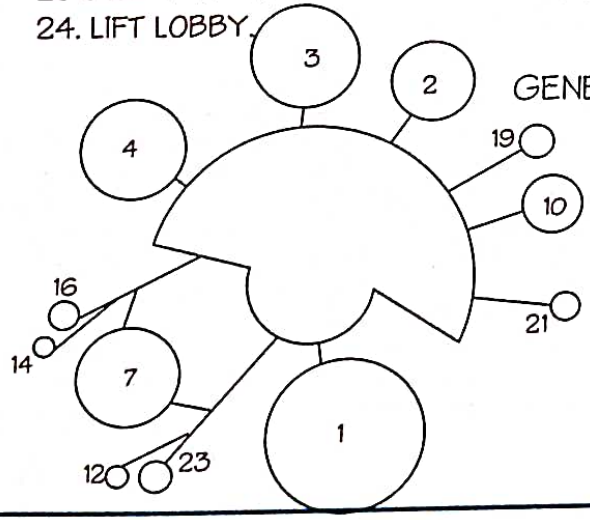


1-11. FOOD STALL.
10. TOILET(M/F).
12 & 14. PRIVATE ENTRY FOR LAB SECTION WITH LIFT.
16 & 23. PRIVATE ENTRY FOR LAB SECTION WITH STAIR CASE
13 & 15. LIFT LOBBY.
17 & 18. PUBLIC LIFT.
19 & 21 PUBLIC STAIR CASE.
20 & 22. AHU ROOM.
24. LIFT LOBBY.

FOOD COURT

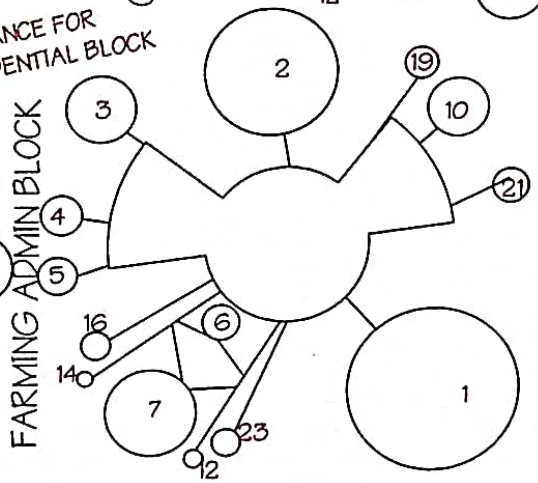


GENERAL LAB SECTION



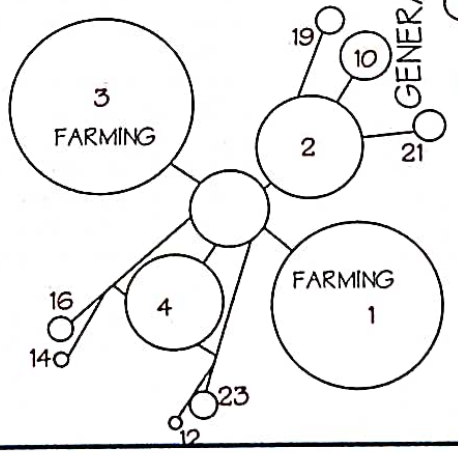
1. PLANT TISSUE CULTURE LAB
2. PLANT PATHOLOGY.
3. HYDROPONICS RESEARCH LAB.
4. HORTICULTURE.

FARMING ADMIN BLOCK

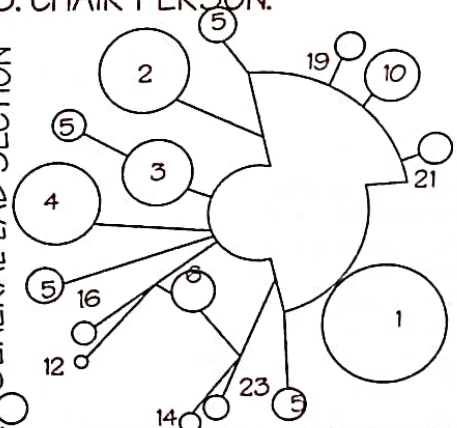


1. AUDI
2. SEMINAR.
3. CONFERENCE.
4. CHAIR PERSON.
5. CHAIR PERSON.

FARMING SECTION

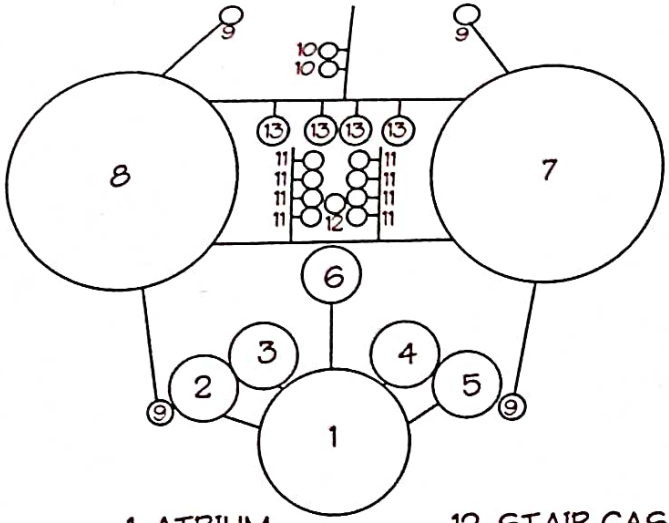


GENERAL LAB SECTION

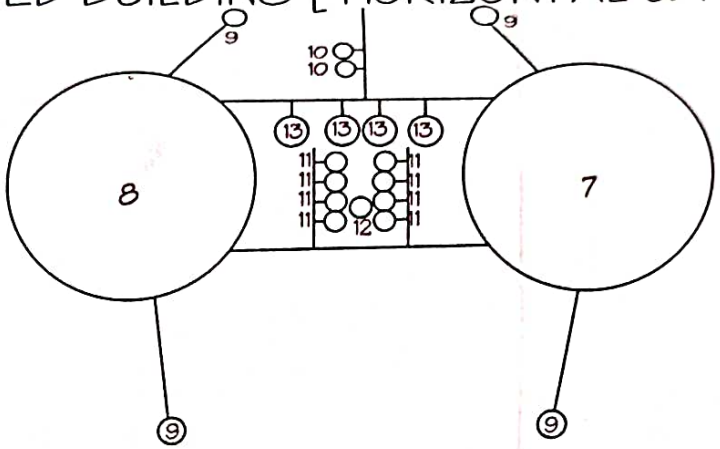


1. ENVIRONMENT BIOTECH
2. VEGETRIAN MANAGEMENT.
3. BIOLOGY LAB.
4. CHEMISTRY LAB.
5.SECTION OFFICE.

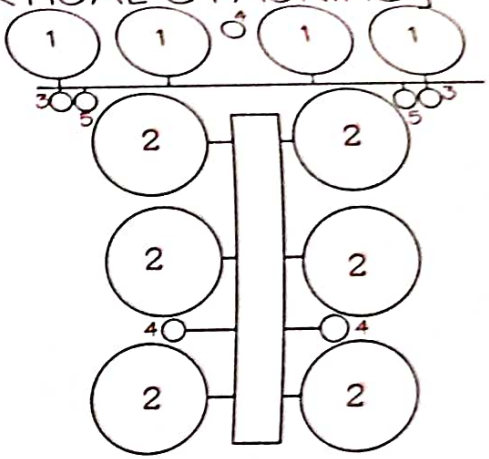
VERTICAL CITY FARM MIXED USED BUILDING [HORIZONTAL & VERTICAL STACKING]



1. ATRIUM.
2-5. CAFE.
6. RECEPTION.
7 & 8 OFFICE AREA.
9. FIRE EXIT.
10. SERVICE LIFT.
11. LIFT.
12. STAIR CASE.
13. TOILETS(M/F).



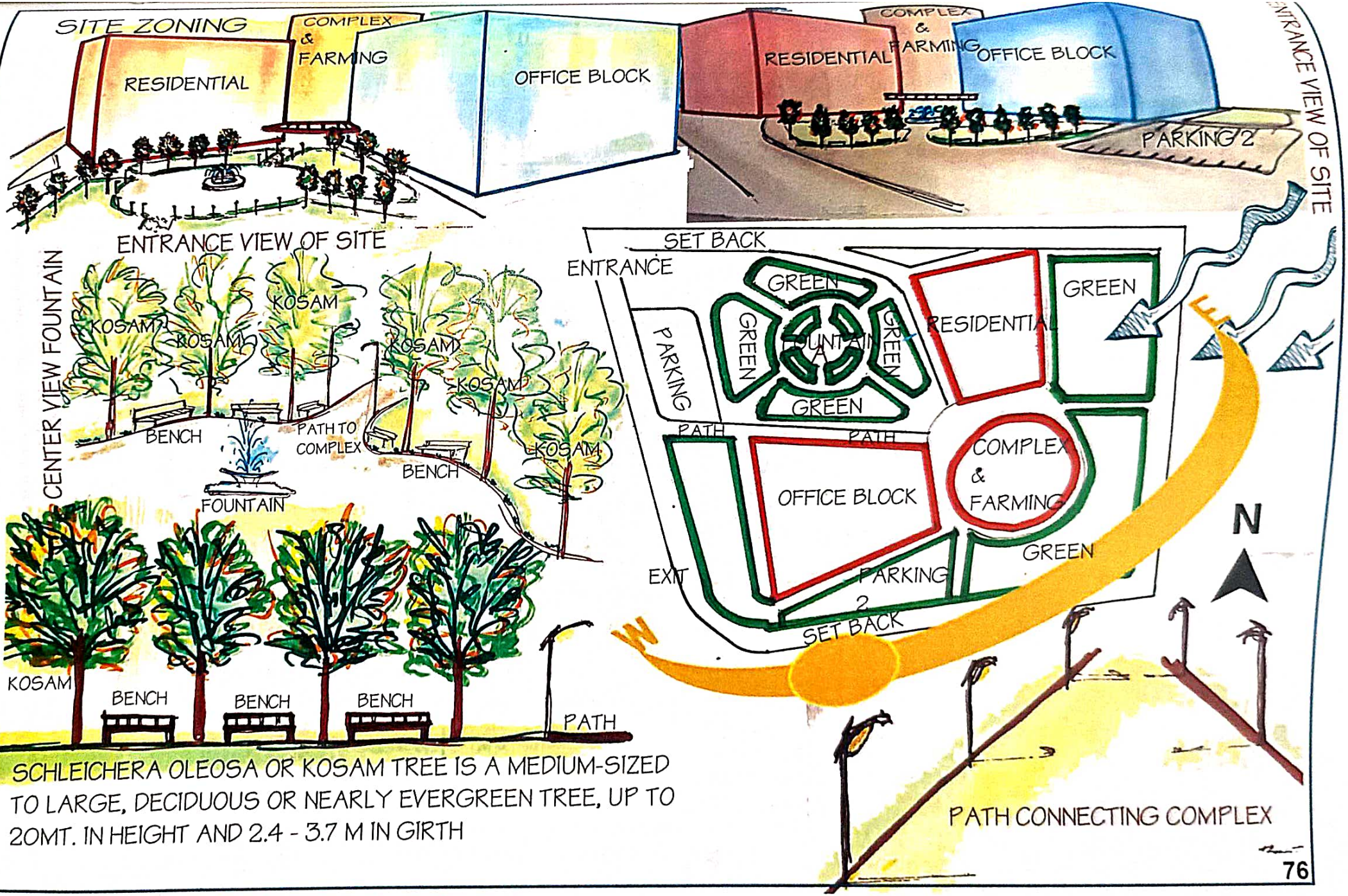
7 & 8 OFFICE AREA.
9. FIRE EXIT.
10. SERVICE LIFT.
11: LIFT.
12. STAIR CASE.
13. TOILETS(M/F).



1. 2BHK.
2. 3BHK.
3. STAIR CASE.
4. FIRE EXIT.
5.LIFT.

	FARMING		
	FARMING		
	FARMING		
	FARMING		OFFICE AREA
RESIDENTIAL	FARMING		OFFICE AREA
RESIDENTIAL	FARMING		OFFICE AREA
RESIDENTIAL	FARMING		OFFICE AREA
RESIDENTIAL	FARMING		OFFICE AREA
RESIDENTIAL	WATER PURIFY		OFFICE AREA
RESIDENTIAL	GENERAL LAB		OFFICE AREA
RESIDENTIAL	GENERAL LAB		OFFICE AREA
RESIDENTIAL	ADMIN BLOCK		OFFICE AREA
RESIDENTIAL	FOOD COURT		OFFICE AREA
RESIDENTIAL	FOOD COURT		OFFICE AREA
RESIDENTIAL	COMPLEX		OFFICE AREA
RESIDENTIAL	COMPLEX		OFFICE AREA
RESIDENTIAL	COMPLEX		OFFICE AREA
STIL FLOOR	ATRIUM COMPLEX	ATRIUM	RECEPTION OFFICE AREA

VERTICAL STACKING

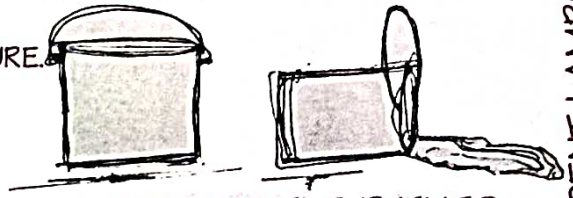


SCHLEICHERA OLEOSA OR KOSAM TREE IS A MEDIUM-SIZED TO LARGE, DECIDUOUS OR NEARLY EVERGREEN TREE, UP TO 20MT. IN HEIGHT AND 2.4 - 3.7 M IN GIRTH

VERTICAL CITY FARM MIXED USED BUILDING[MATERIALS]

MATERIALS WHICH WE ARE USING ARE AS FOLLOWS:

1. STEEL FRAMED STRUCTURE.
2. GREEN CONCRETE.
3. FLY ASH BRICKS.
4. LOW-E-GLASSES.
5. GREEN INSULATION.
6. LOW VOLTAILE PAINTS.
7. FLOURECENT LAMPS.



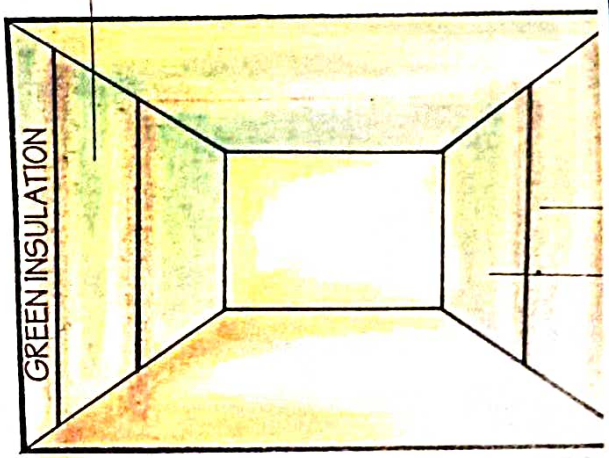
LOW VOLTAILE PAINTS

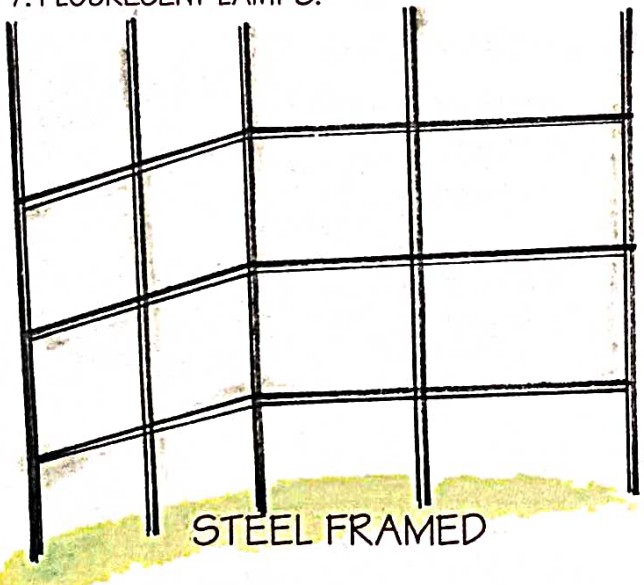
FLOURECENT LAMPS

T5 T8

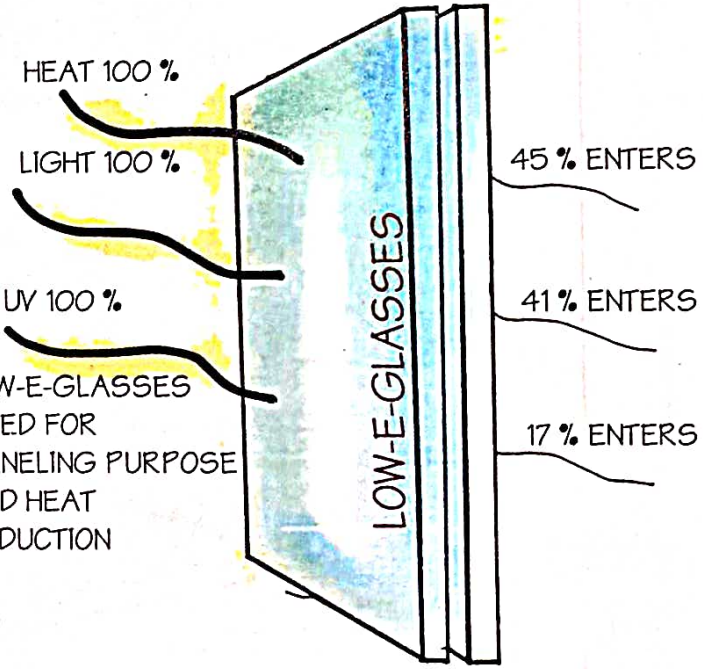
T MEANS TUBULAR IN SHAPE AND 5 MEANS 5/8" IN DIAMETER .
AND 8 MEANS 8/8" IN DIAMETER.
T5 GIVES MORE LIGHT IN SMALL SPACE.

FORM LAYERING FOR INSULATION



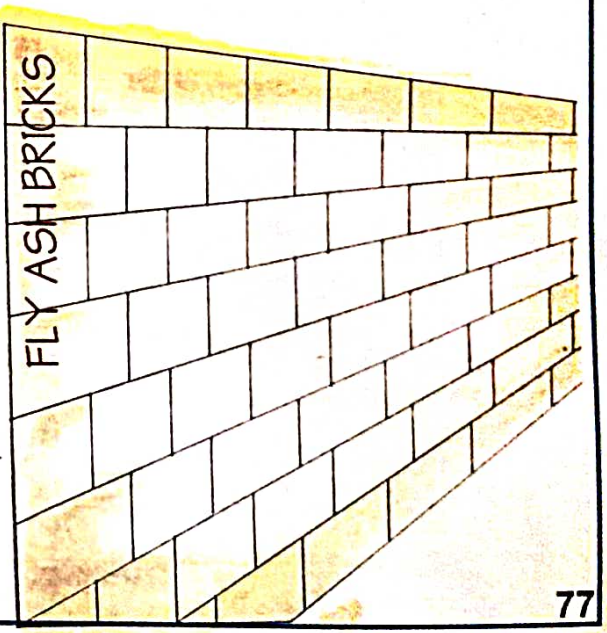


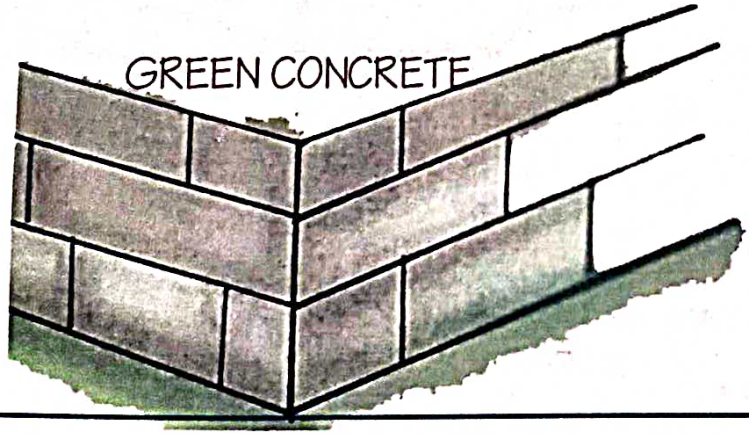
STEEL FRAMED



LOW-E-GLASSES USED FOR PANELING PURPOSE AND HEAT REDUCTION

FLY ASH BRICK (FAB) IS A BUILDING MATERIAL, SPECIFICALLY MASONRY UNITS, CONTAINING CLASS C OR CLASS F FLY ASH AND WATER.





GREEN CONCRETE

CONCRETE WHICH IS MADE FROM CONCRETE WASTES THAT ARE ECO-FRIENDLY ARE CALLED AS "GREEN CONCRETE". GREEN CONCRETE IS A TERM GIVEN TO A CONCRETE THAT HAS HAD EXTRA STEPS TAKEN IN THE MIX DESIGN AND PLACEMENT TO INSURE A SUSTAINABLE STRUCTURE AND A LONG LIFE CYCLE WITH A LOW MAINTENANCE SURFACE. E.G. ENERGY SAVING, CO2 EMISSIONS, WASTEWATER.

VERTICAL CITY FARM MIXED USED BUILDING [TECHNOLOGIES]

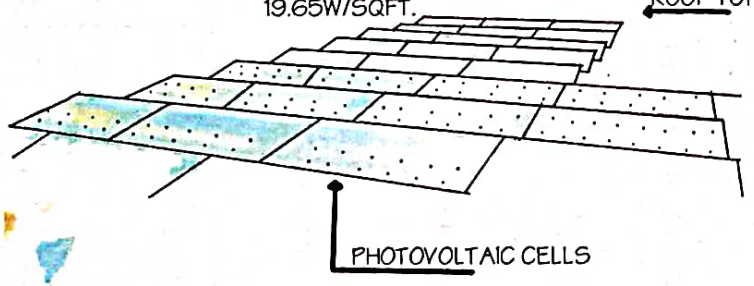
BUILDING WITH TECHNOLOGIES ENHANCES IT'S WORKABILITY SOME OF THEM ARE USED TO ENHANCE THE WORKABILY OF MY PROJECT.

1. PHOTOVOLTAIC CELLS.
2. RAIN WATER HARVESTING.
3. SOUTH FACING FACADE TREATED WITH VERTICALLY LAID CREEPERS.
4. HARTMAN LOOP SYSTEM.
5. SMART LOUVERED GLASSES.
6. FOUNDATION IN EARTHQUAKE ZONE.

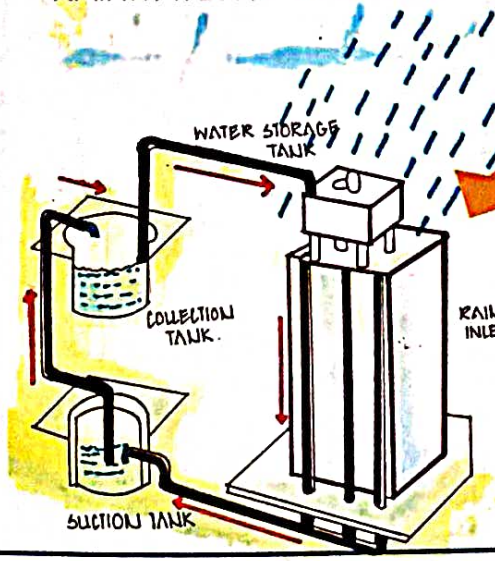
PHOTOVOLTAIC CELLS

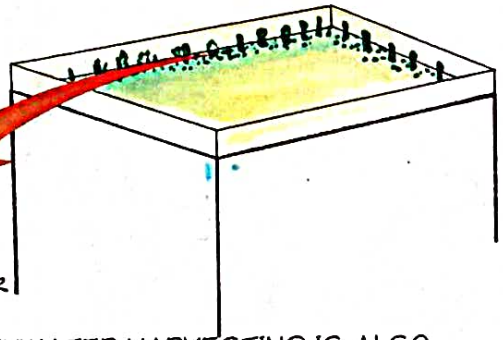
NATURAL LIGHT

280 W RATING, 345 W RATING.
280W: 17.62 SQFT PRODUCE 15.89W/SQFT.
345W:17.55 SQFT PRODUCE 19.65W/SQFT.



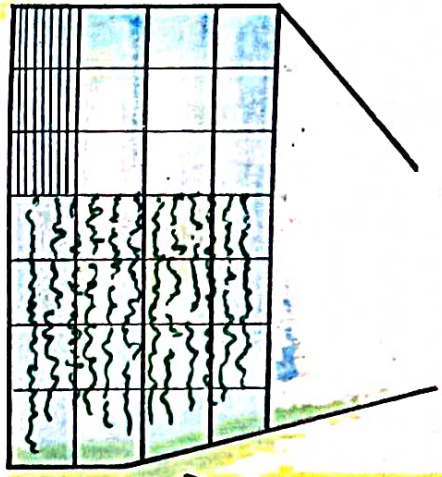
RAINWATER HARVESTING





RAINWATER HARVESTING IS ALSO BEING PRACTICED WITH TERRACE GARDENING FOR NATURAL FILTERAION OF WATER.

SOUTH FACING FACADE



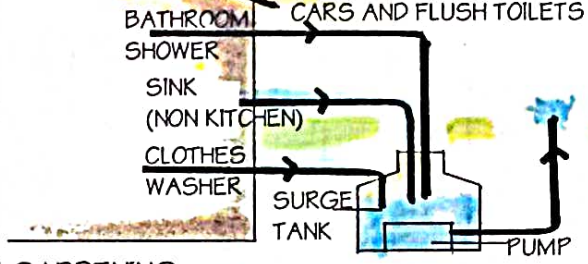
HARTMAN LOOP SYSTEM

THIS SYSTEM IS USED FOR HVAC.

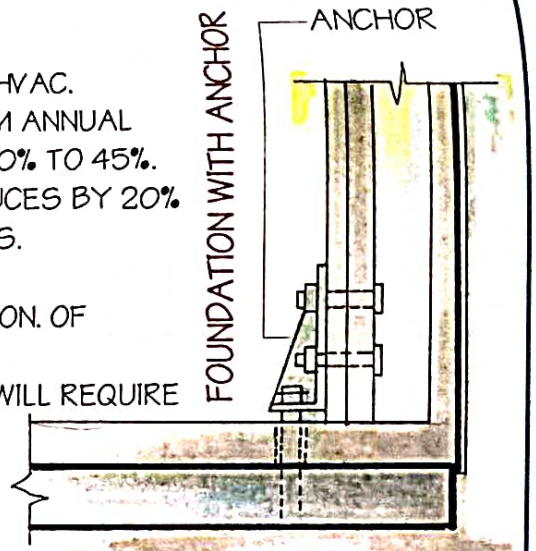
1. IN HARTMAN LOOP SYSTEM ANNUAL ENERGY COST REDUCTION 20% TO 45%.
2. AND ITS PLANT SIZE REDUCES BY 20% IN COMPERISON WITH OTHERS.
3. CHILLED WATER IS USED.
4. FOR EACH 400 SQFT = 1 TON. OF COOLING REQUIRED.
5. FOR 1 TON. OF COOLING IT WILL REQUIRE =0.6KW OF ELECTRICITY.

GREY WATER RE USE

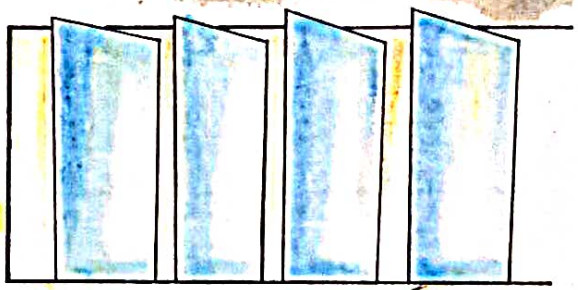
THE GREY WATER IS TO IRRIGATE GARDENS, WASH CARS AND FLUSH TOILETS



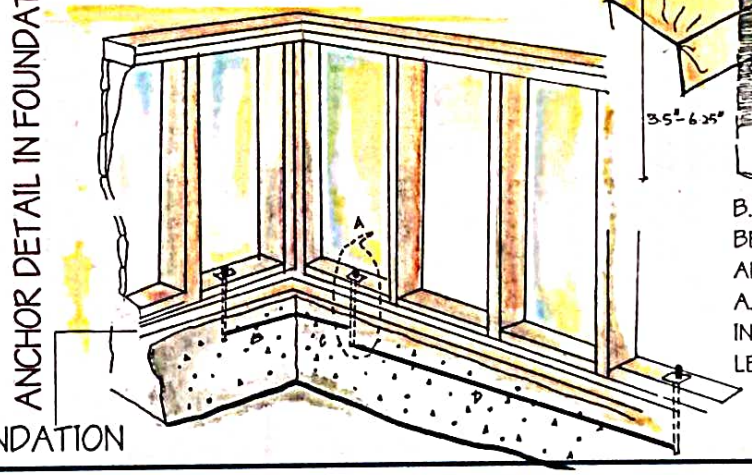
FOUNDATION WITH ANCHOR

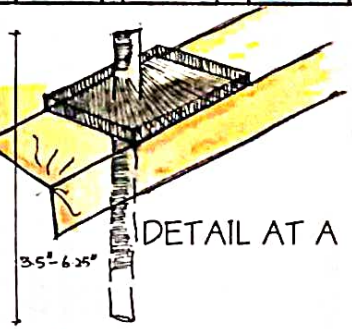


SMART LOUVERED GLASSES



ANCHOR DETAIL IN FOUNDATION





B. 12" OR GREATER BETWEEN ANCHOR AND CORNER.
A. ANCHOR SPACING MUST BE 6' OR LESS.

AREA ANALYSIS

RESIDENTIAL BLOCK

SNO.	REQUIREMENTS	STANDARDS (PER PERSON)	PROJECT REQUIREMENT	TOTAL AREA	
1.	2BHK FLAT	4@12.5 SQMT FOR 1 PERSON	4@62.5 SQMT FOR 5 PERSONS	250 SQMT.	3305 SQMT.
2.	3 BHK FLAT	6@12.5 SQMT FOR 1 PERSON	6@87.5 SQMT FOR 7 PERSONS	525 SQMT.	
3.	4 BHK FLAT	8@12.5 SQMT FOR 1 PERSON	4@100 SQMT FOR 8 PERSONS	400 SQMT.	
4.	5 BHK FLAT	10@12.5 SQMT FOR 1 PERSON	4@137.5 SQMT FOR 10 PERSONS	550 SQMT.	
5.	INTERACTIVE SPACE	1.5 SQMT FOR 1 PERSONS	1155 SQMT FOR 770 PERSONS	1155 SQMT.	
6.	SPACE FOR GATHERING	1.5 SQMT FOR 1 PERSONS	425 SQMT FOR 284 PERSONS	425 SQMT.	

OFFICE BLOCK

SNO.	REQUIREMENTS	STANDARDS (PER PERSON)	PROJECT REQUIREMENT	TOTAL AREA	
A.	ENTRANCE	1.5 SQMT FOR 1 PERSONS	1620 SQMT FOR 1080 PERSONS		
1A.	CAFE	2 SQMT FOR 1 PERSONS	4@80 SQMT FOR 24 PERSONS	320 SQMT.	
2A.	WAITING AREA	2 SQMT FOR 1 PERSONS	200 SQMT FOR 100 PERSONS	200 SQMT.	
3A.	FACILITIES(M/F)	2 SQMT FOR 1 W.C 1.5 SQMT FOR 1 W.B 1.5 SQMT FOR 1 URINALS	FOR (50:50) OF (M:F) 20 SQMT FOR 100 MALES. 24.5 SQMT FOR 100 FEMALES.	44.5 SQMT.	
4A.	SPACE FOR CIRCULATION FOR WORKING STAFF AND OFFICE BOYS	1.5 SQMT FOR 1 PERSONS	1055 SQMT FOR 690 PERSONS	1055 SQMT.	
				1619.5 SQMT.	1620 SQMT.

SNO.	REQUIREMENTS	STANDARDS (PER PERSON)	PROJECT REQUIREMENT	TOTAL AREA	
1.	WORKING STAFF	4 SQMT FOR 1 PERSONS	800 SQMT FOR 200 PERSONS	800 SQMT.	1378 SQMT.
2.	SENIOR STAFF	12 SQMT FOR 1 PERSONS	120 SQMT FOR 10 PERSONS	120 SQMT.	
3.	RECEPTION / ENTRANCE	1.5 SQMT FOR 1 PERSONS	315 SQMT FOR 210 PERSONS	315 SQMT.	
4.	MEETING AREA (A)	1.5 SQMT FOR 1 PERSONS	15 SQMT FOR 10 PERSONS	15 SQMT.	
5.	MEETING AREA (B)	1.5 SQMT FOR 1 PERSONS	15 SQMT FOR 4 PERSONS	15 SQMT.	
6.	MEETING AREA (C)	1.5 SQMT FOR 1 PERSONS	15 SQMT FOR 6 PERSONS	15 SQMT.	
7.	SERVER ROOM	AS PER CASE STUDY	24 SQMT	24 SQMT.	
8.	BREAKOUT AREA	2 SQMT FOR 1 PERSONS	64 SQMT FOR 32 PERSONS	64 SQMT.	
8.	FACILITIES AREA	AS PER CASE STUDY	10 SQMT	10 SQMT.	

SNO.	REQUIREMENTS	STANDARDS (PER PERSON)	PROJECT REQUIREMENT	TOTAL AREA	
1.	AHU ROOM	AS PER CASE STUDY	2@63 SQMT	126 SQMT.	994.4 SQMT. APPROX. 1000 SQMT.
2.	LIFT	AS PER CASE STUDY	8@11 SQMT.	88 SQMT.	
3.	FIRE EXIT	AS PER CASE STUDY	4@13.5 SQMT.	54 SQMT.	
4.	SERVICE LIFT	AS PER CASE STUDY	2@10.5 SQMT	21 SQMT.	
5.	FACILITIES MALE	2 SQMT FOR 1 W.C 1.5 SQMT FOR 1 W.B 1.5 SQMT FOR 1 URINALS	2@24.5 SQMT FOR 126 MALES.	49 SQMT.	
6.	FACILITIES FEMALE	2 SQMT FOR 1 W.C 1.5 SQMT FOR 1 W.B	2@21 SQMT FOR 84 FEMALES.	42 SQMT.	
7.	OTHER SERVICES	AS PER CASE STUDY	614.4 SQMT	614.4 SQMT.	

TOTAL AREA FOR OFFICE BUILDING=1620+(1378X2)+1000
=5376 SQMT.

AREA ANALYSIS

VERTICAL FARMING

S.NO.	REQUIREMENTS	STANDARDS (PER PERSON)	PROJECT REQUIREMENT	TOTAL AREA	
1.	ADMINISTRATION ROOM	12 SQMT FOR 1 PERSON. 2 SQMT FOR 5 PERSON. (W.A) 4 SQMT FOR 5 PERSONS.	42 SQMT.	42 SQMT.	1922.5 SQMT. APPROX. 1923 SQMT.
2.	CHAIR PERSON		2@42 SQMT.	84 SQMT.	
3.	WAITING HALL	2 SQMT FOR 1 PERSONS	2@40 SQMT FOR 20 PERSONS	80 SQMT.	
4.	STORE ROOM	AS PER CASE STUDY	2@10 SQMT.	20 SQMT.	
5.	CONFERENCE HALL	1.2 SQMT FOR 1 PERSONS	2@66 SQMT FOR 55 PERSONS	132 SQMT.	
6.	SEMINAR ROOM	1.5 SQMT FOR 1 PERSONS	2@150 SQMT FOR 100 PERSONS	300 SQMT.	
7.	AUDITORIUM	2 SQMT FOR 1 PERSONS	2@600 SQMT FOR 300 PERSONS	1200 SQMT.	
8.	FACILITIES (M/F)	2 SQMT FOR 1 W.C 1.5 SQMT FOR 1 W.B 1.5 SQMT FOR 1 URINALS	FOR (50:50) OF (M:F) 38.5 SQMT FOR 150 MALES. 26 SQMT FOR 150 FEMALES.	64.5 SQMT.	

S.NO.	REQUIREMENTS	STANDARDS (PER PERSON)	PROJECT REQUIREMENT	TOTAL AREA	
1.	LAB COORDINATION	12 SQMT FOR 1 PERSON. 4 SQMT FOR 7 PERSONS. 2 SQMT FOR 5 PERSONS.(W.A)	50 SQMT.	50 SQMT.	2960 SQMT
2.	SECTION OFFICE	12 SQMT FOR 1 PERSON. 4 SQMT FOR 2 PERSONS.	5@20 SQMT.	100 SQMT.	
3.	CHEMISTRY LAB	8.75 SQMT FOR 1 PERSON	3@90 SQMT FOR 10 PERSONS	270 SQMT.	
4.	VEGETARIAN (RESEARCH)	6.6 SQMT FOR 1 PERSON	2@90 SQMT FOR 13 PERSONS	180 SQMT.	
5.	HORTICULTURE (MATERIAL TESTING)	10 SQMT FOR 1 PERSON	2@90 SQMT FOR 9 PERSONS	180 SQMT.	
6.	BIOLOGY LAB (RESARCH)	6.6 SQMT FOR 1 PERSON	2@80 SQMT FOR 12 PERSONS	160 SQMT.	
7.	HYDROPONICS LAB (MATERIAL TESTING)	10 SQMT FOR 1 PERSON	3@80 SQMT FOR 8 PERSONS	240 SQMT.	
8.	FACILITIES (M/F)	2 SQMT FOR 1 W.C 1.5 SQMT FOR 1 W.B 1.5 SQMT FOR 1 URINALS	FOR (50:50) OF (M:F) 38.5 SQMT FOR 150 MALES. 26 SQMT FOR 150 FEMALES.	64.5 SQMT.	
9.	PLANT TISSUE LAB (MATERIAL TESTING)	10 SQMT FOR 1 PERSON	5@90 SQMT FOR 9 PERSONS	450 SQMT.	
10.	ENVIRONMENT BIOTECH (RESEARCH)	6.6 SQMT FOR 1 PERSON	4@110 SQMT FOR 16 PERSONS	440 SQMT.	
11.	QUALITY CONTROL (RESEARCH)	6.6 SQMT FOR 1 PERSON	3@150 SQMT FOR 22 PERSONS	450 SQMT.	
12.	PLANT PATHOLOGY (MATERIAL TESTING)	10 SQMT FOR 1 PERSON	4@110 SQMT FOR 11 PERSONS	440 SQMT.	

HENCE AREA FOR VERTICAL FARMING=2960 SQMT.
APPROX = 3000 SQMT.

COMPLEX

S.NO.	REQUIREMENTS	STANDARDS (PER PERSON)	PROJECT REQUIREMENT	TOTAL AREA	
1.	COMPLEX FOR 5000-7000 PERSONS	0.5 SQMT FOR 1 PERSON	3500 SQMT FOR 7000 PERSONS		
1A.	ATRIUM	1.5 SQMT FOR 1 PERSON	700 SQMT FOR 466 PERSONS	700 SQMT.	
2A.	FACILITIES(M/F)	2 SQMT FOR 1 W.C 1.5 SQMT FOR 1 W.B 1.5 SQMT FOR 1 URINALS	FOR (50:50) OF (M:F) 230 SQMT FOR 5000 MALES. 215 SQMT FOR 5000 FEMALES.	445 SQMT.	

HENCE AREA FOR COMPLEX = 3500 SQMT.

AREA ANALYSIS

1. PLOT AREA 51540 SQMT.
2. GROUND COVERAGE 40%
3. F.A.R 4.

GROUND COVERAGE = (51540 X 40)/100.
=20616 SQMT.

BUILT UP = PLOT AREA X F.A.R
= 51540 X 4.
= 206160 SQMT.

PROPOSED GROUND COVERAGE:

1. RESIDENTIAL = 3305 SQMT.
2. OFFICE BUILDING = 5376 SQMT.
3. COMPLEX (VERTICAL FARMING) = 3500 SQMT.

TOTAL PROPOSED GROUND COVERAGE = (3305+5376+3500) SQMT.
= 12181 SQMT.

TOTAL BUILT UP:

1. RESIDENTIAL = 3305 X 15
= 49575 SQMT.
2. OFFICE BUILDING = 5376 X 15
= 80640 SQMT.
3. COMPLEX & VERTICAL FARMING = 3500 X 18
= 63000 SQMT.

PROPOSED BUILT UP = (49575+80640+63000) SQMT.
= 193215 SQMT.

PARKING CALCULATION FOR COMMERCIAL

TOTAL FAR AREA / 100
TOTAL FAR AREA = 5376 X 15
= 80640.
NO OF CARS = 80640 / 100.
= 806.4 = 807 CARS.
BASEMENT PARKING = 5376 / 30.
= 179 CARS.
NO.OF BASEMENT = 4
HENCE TOTAL NO. OF CARS = 179 X 4 = 716 CARS.
SURFACE PARKING= 1963 / 20 = 98 CARS.
TOTAL PARKING PROPOSED = 716 + 98 = 814 CARS.

PARKING CALCULATION FOR RESIDENTIAL

TOTAL FAR AREA / 150
TOTAL FAR AREA = 3305 X 15
= 49575
NO OF CARS = 49575 / 150.
= 330.5 = 331 CARS.
BASEMENT PARKING = 3305 / 30.
= 110 CARS.
NO.OF BASEMENT = 1
HENCE TOTAL NO. OF CARS = 110 X 1 = 110 CARS.
STILT PARKING=3305 / 30 = 110 CARS.
SURFACE PARKING = 2780 /20 = 139 CARS.
TOTAL PARKING PROPOSED = 110+110+139 = 359 CARS.

SITE:

1. COMPLEX BLOCK.
2. OFFICE BLOCK.
3. RESIDENTIAL BLOCK.