

A photograph of a golf course. In the foreground on the left, a large tree with green leaves partially obscures the view. The middle ground shows a lush green golf course with rolling hills. In the background, a line of trees separates the course from a city skyline. A red flag is visible on a pole near the buildings. The sky is a pale, hazy blue.

SHAPING A SUSTAINABLE INDIA

Presented by

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Assotech Limited

Shaping A Sustainable India

Case Study

Of

CROSSINGS REPUBLIK

360 ACRES

NEW COMMUNITY INTEGRATED TOWNSHIP

FOR

150,000 POPULATION



A SHINING EXAMPLE OF SUSTAINABLE INDIA

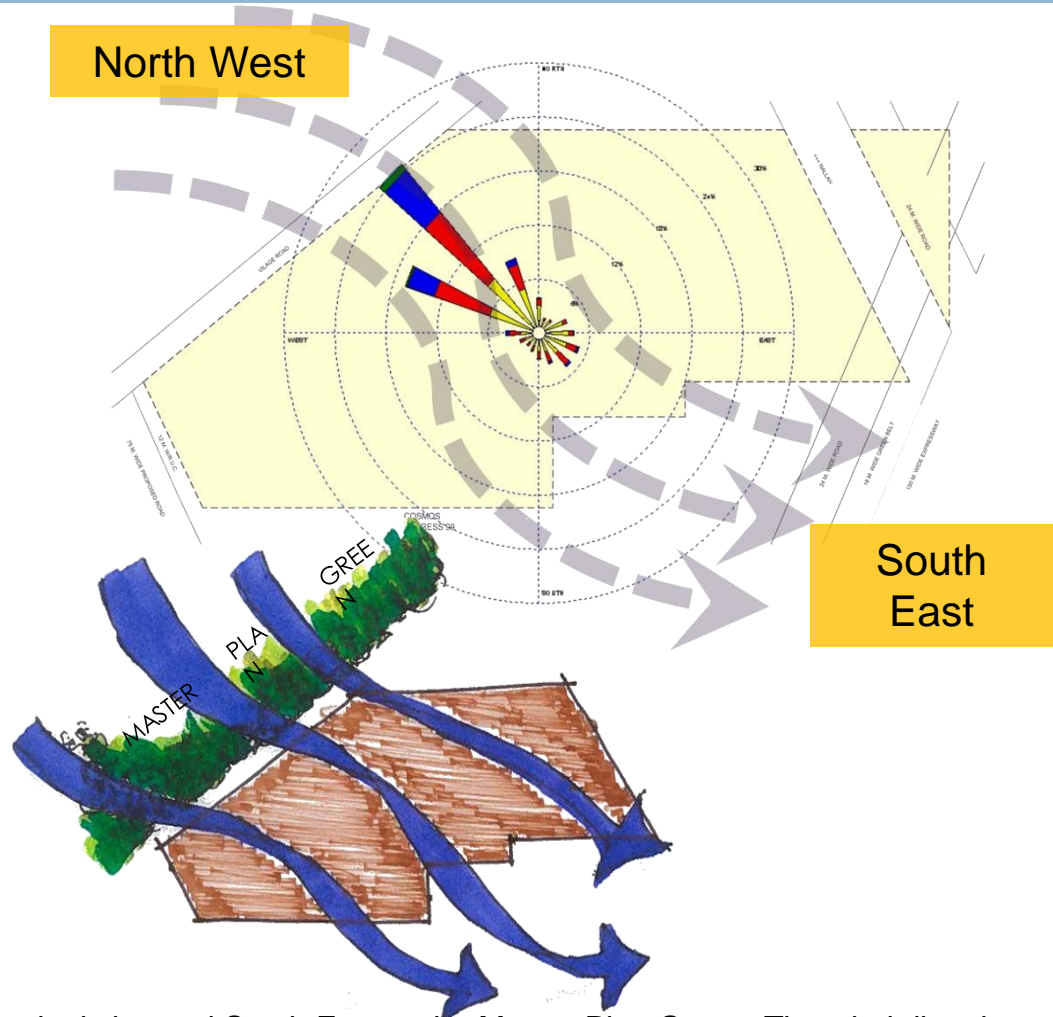
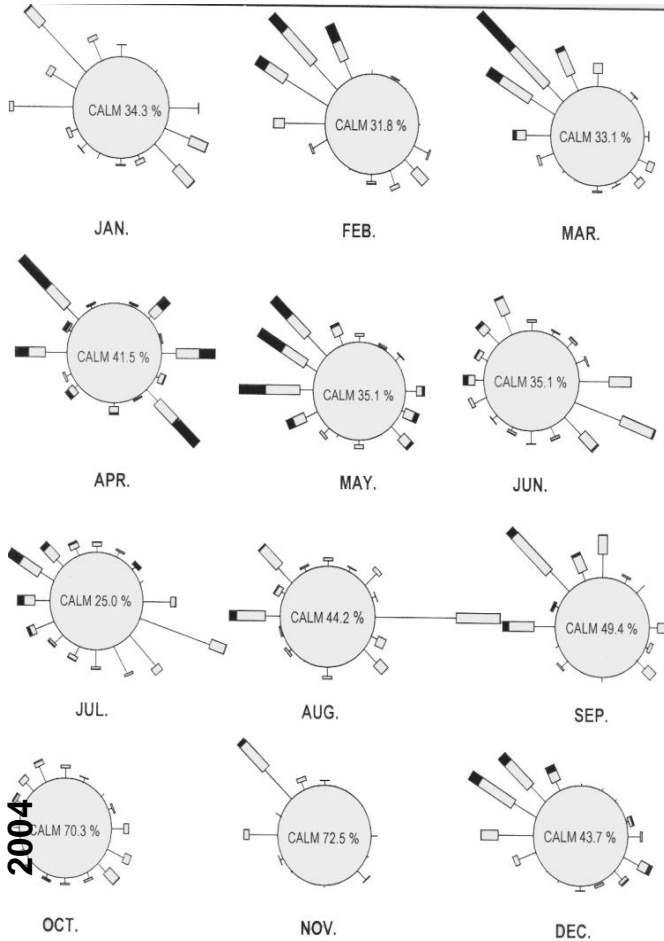
Concept

- Is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation.
- The design to reduce the overall impact of the built environment on human health and the natural environment by:
 - Efficiently using energy, water, and other resources
 - Protecting occupant's health and improving employee productivity
 - Reducing waste, pollution and environmental degradation.

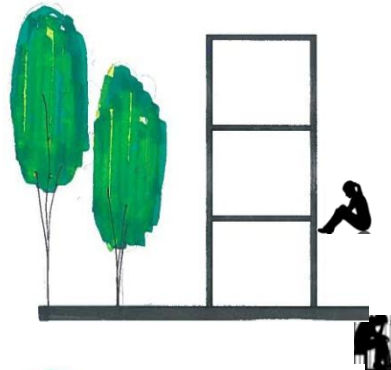
Climatology: Wind

Wind Rose Diagram gives the monthly wind direction for the site to understand the annual wind pattern. The Average Annual Wind Direction is North West to South East. The winds in this zone on an average are light but gain force in summers and monsoons.

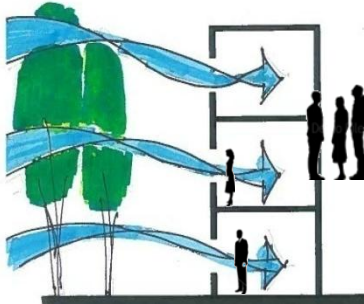
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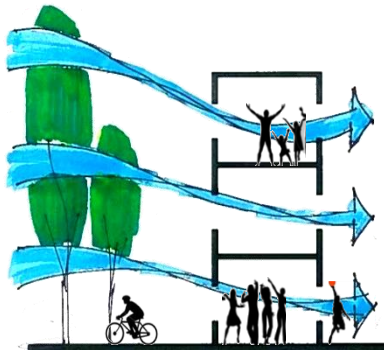
The site is located South East to the Master Plan Green. The wind direction being North West to South East will bring purified cool breeze into the site.



No Natural Ventilation

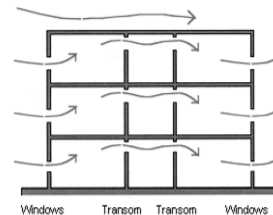


No Outlet

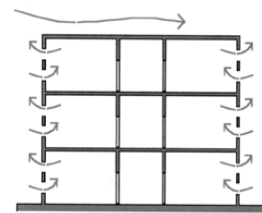


Cross Ventilation

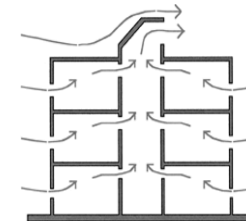
Variations in Wind Movement through the Building



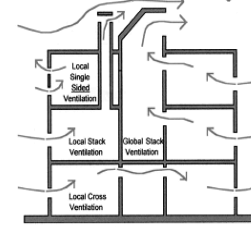
Stack ventilation diagram



Single-sided ventilation diagram



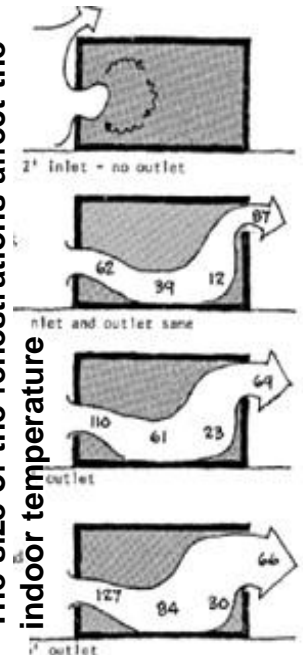
Cross or through ventilation diagram



Mixed cross, single-sided local, and stack ventilation strategies

Human comfort is a function of four primary variables; air temperature, air movement, humidity, and the mean radiant temperature of interior surfaces. Natural ventilation is an energy efficient way to increase human comfort because air movement increases heat transfer from the surface when cooler outside air replaces warm and humid indoor air. Natural ventilation, unlike fan-forced ventilation, uses the natural forces of wind and buoyancy to deliver fresh air into buildings.

The size of the fenestrations affect the indoor temperature



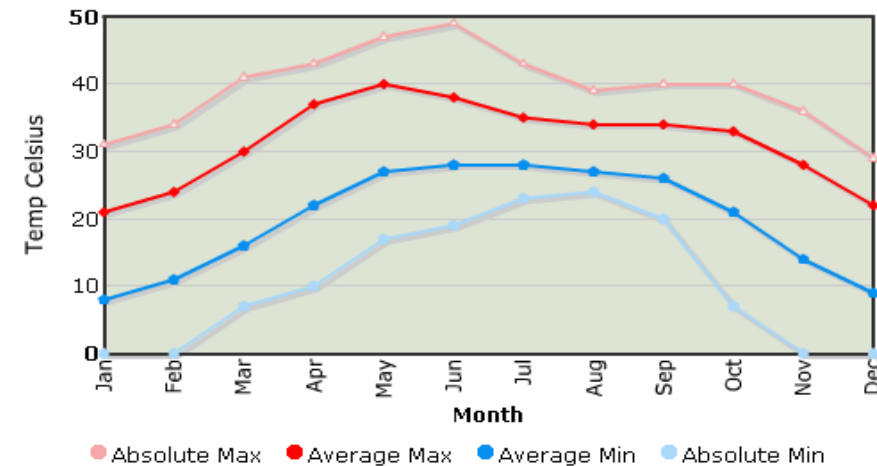
To maximize Natural Ventilation in buildings:

Ghaziabad falls in the Composite Climatic Zone of India having all types of climatic characteristics from hot & dry, warm, humid as well as cold conditions.

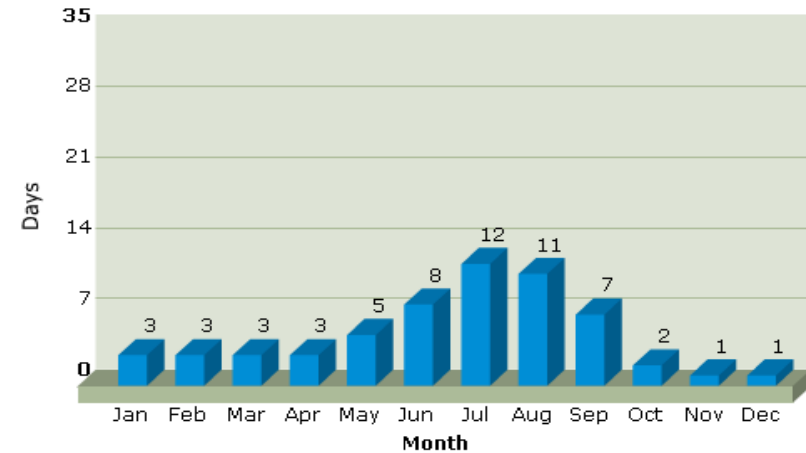
A climatic data glance over the past two decades for monthly average weather conditions with exceptional occurrences is given below:

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Temperatures: Averages and Extremes



Number of Rain/Drizzle days in month



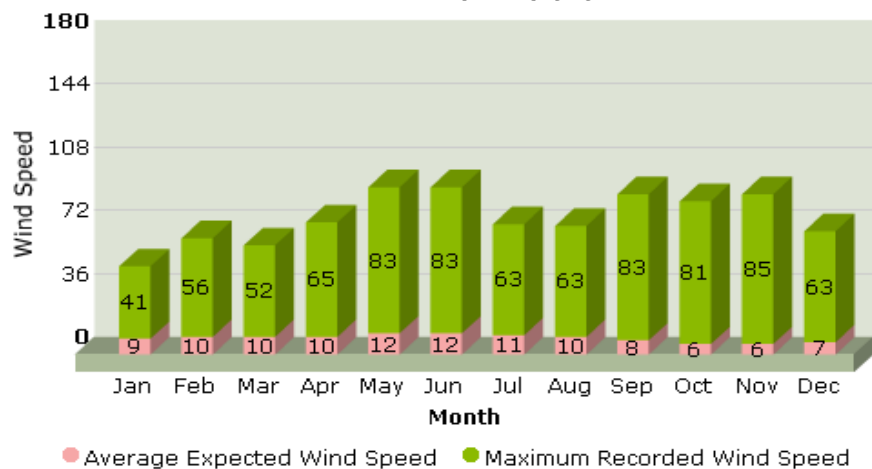
TEMPERATURE

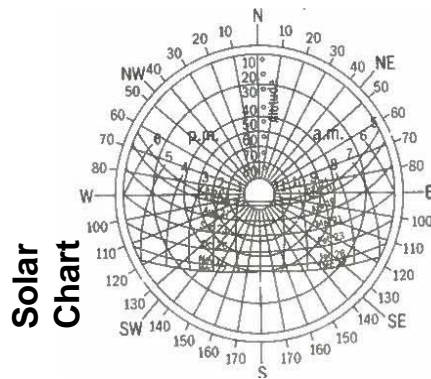
- Hottest Months- May, June
- Coldest Months- December, January

RAINFALL

Normal Annual Rainfall: 553mm

Wind Speed (kph)

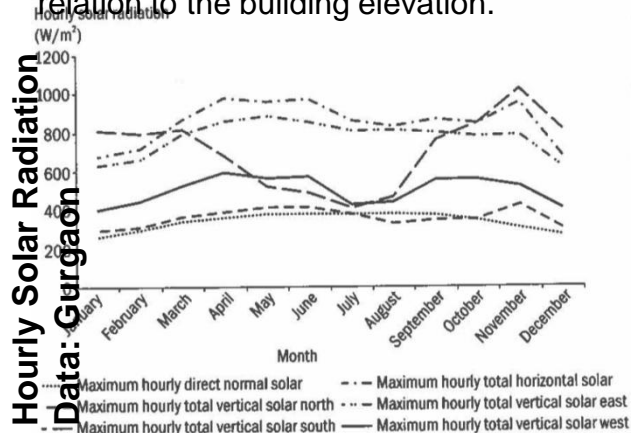




Solar Chart

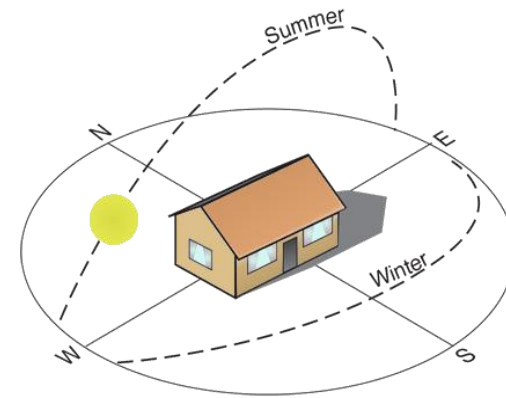
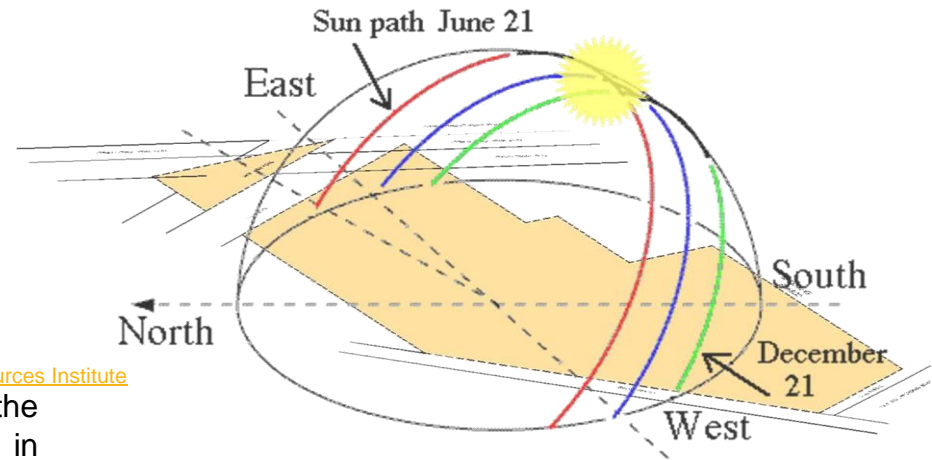
Sustainable Building Design Practices: By Energy and Resources Institute

This solar chart is used to establish the angle of incidence of solar radiation in relation to the building elevation.



Hourly Solar Radiation Data: Gurgaon

Sustainable Building Design Practices: By Energy and Resources Institute



The Sun is at Higher Altitude in Summers and Lower Altitude in Winters.

To maximize Sunlight in buildings:

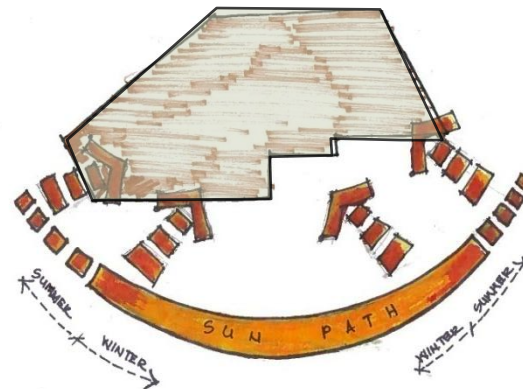
Building Orientation helps in maximizing the daylight.

Architectural Treatments like light shelves, sun shades, louvres can prevent/ maximize the sun in the apartment.

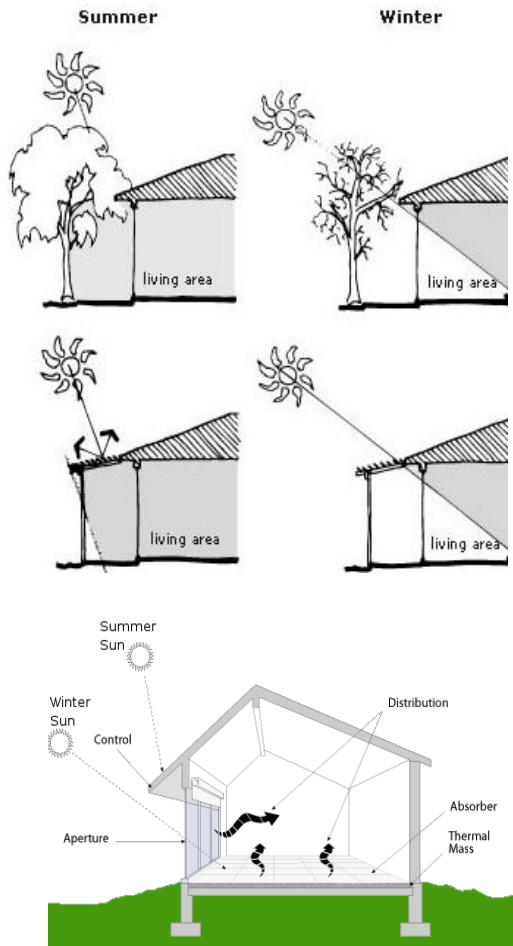
The location, size and control of fenestrations can control the sunlight and temperature in the apartment.

The sun light for winters and summers can also be taken care the type of vegetation.

The use of appropriate material and insulation can help in maintaining the room temperature.

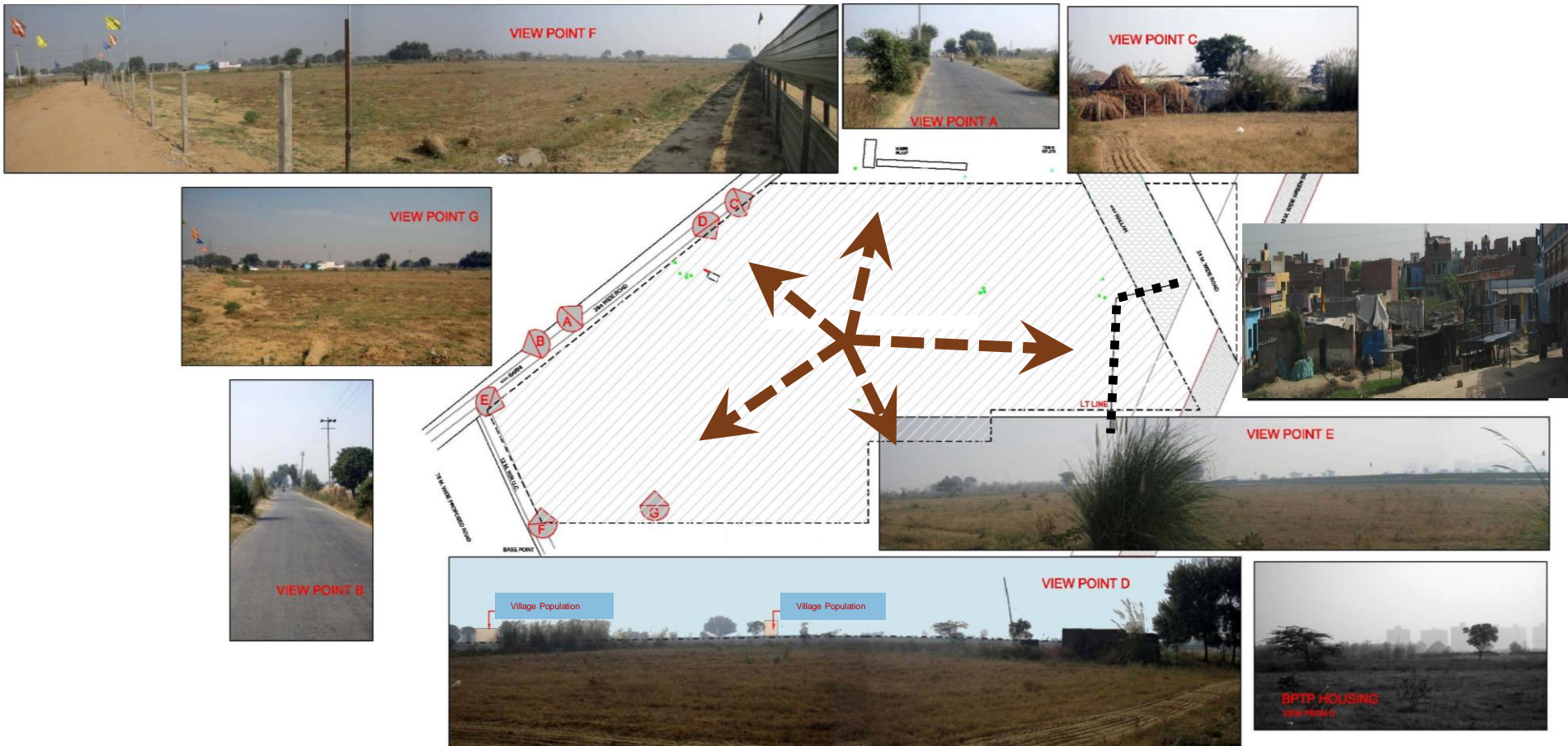


To maximize the usage of daylight in maximum number of apartments on the site, Low rise development should be on the Southern side and High rise development should be on the Northern side.



Initial Site Image

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PLANNING CONSIDERATIONS

- Maximum utilization of Natural Resources
- Gated community with three tier security system
- Tower in front to be planned in such a way so that it can enhance the beauty of the site and can act as a landmark.
- Natural light and Ventilation to maximum number of apartments
- Maximize Green Area with large central park, fountains and water bodies
- Towers to face maximum open spaces and landscaped courts
- Outdoor Play Areas (Hard and Soft)
- Basement for Parking and Services
- Energy Efficiency
- Vaastu Compliance
- Kid's Bus Shelter
- Party Lawns/ Celebration Court
- Convenient and Daily needs Shop

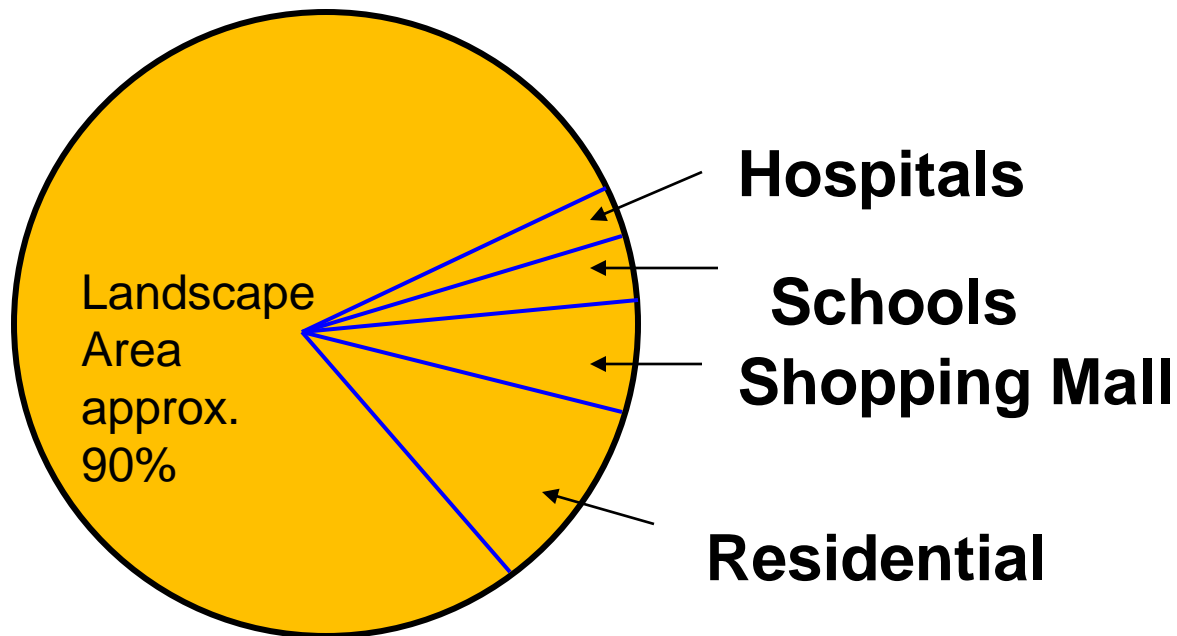
ARCHITECTURAL CONSIDERATIONS

- Intelligent building concept
- Towers to have covered drop offs with landscaped surroundings
- Double height Entrance Lobby
- Provision of Utility balconies
- Deep Balconies
- IIT vetted Earthquake Resistant RCC Framed Structure (Zone V Compliant)
- High Speed Elevators
- Separate swimming pools for males and females
- 100% backup for common areas
- Dedicated Driver facilities and Maid's Room
- Office space for complaints and monitoring for an Efficient Maintenance System

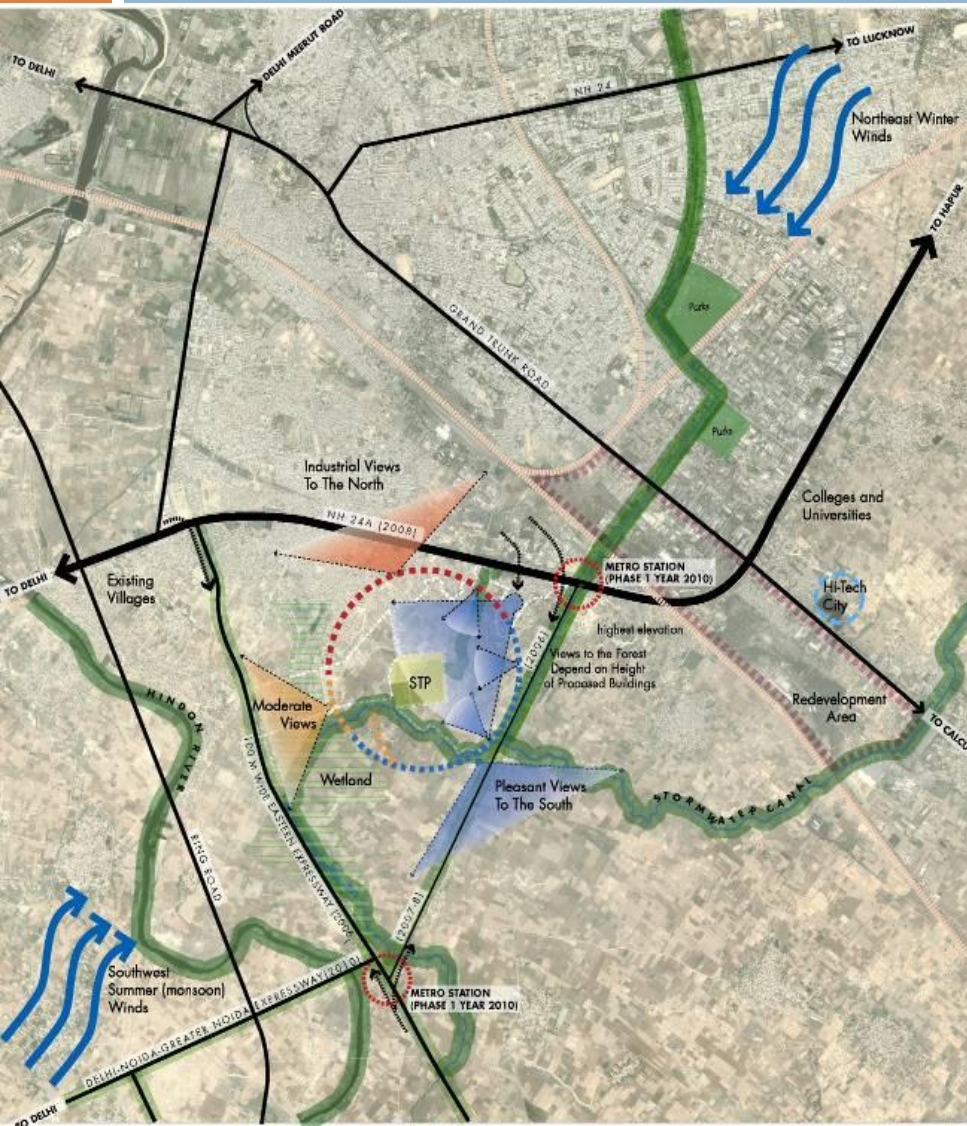


LandScape Use Programme

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Opportunities & Constraints



OPPORTUNITIES:

- Proximity to Delhi
- Site Access
- Regional Population Growth
- Existing Waterways
- New Northern Development
- Viewshed
- Flat Topography
- Greenbelts and Greenways
- Wetlands

CONSTRAINTS:

- Polluted Waterways
- Image of Ghaziabad
- Industrial Development
- Existing STP
- Adjacent Villages

Conversion from land to home , Conserving the nature thro' green architecture, through sustainable development

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Original Shape



Present Status



Original Shape



Present Status



Original Shape



Present Status



Uses Resource Optimization for self sufficiency

Construction Phase :

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□ Earth Excavation and Balancing

Excavation

Excavation of earth
in Residential & Commercial sectors

Volume

5,00,000 cum till date

□ Optimum Utilization

Road work- 50% For developing Road embankment inside the Township

Horticulture -30% For developing Green area inside sectors, Roadside & Central verges

Back filling – 20% For leveling of land

Fly Ash (Used in)

- ▣ Ready mixed concrete
4MT/lacs cum of fly ash used in concrete
- ▣ Fly Ash bricks
2.5 lacs cum fly ash brick used in residential and commercial sectors.
- ▣ Fly Ash blocks of Different Sizes
2500 cum fly ash blocks such as kerb stones has been used in footpath and allied works.

Fly ash content (approx. 2MT) has been used in
Grass Pavers and Footpath Tiles



Construction Waste Material:

Mulba and other Debris material have been used as a soling coat in Road work.

Existing Nalah:

Nalah along the Periphery of township - Approx.- 10,000 plants have been planted

Original Shape of Nalah



Thick Plantation Along the Nalah



Operation Phase :

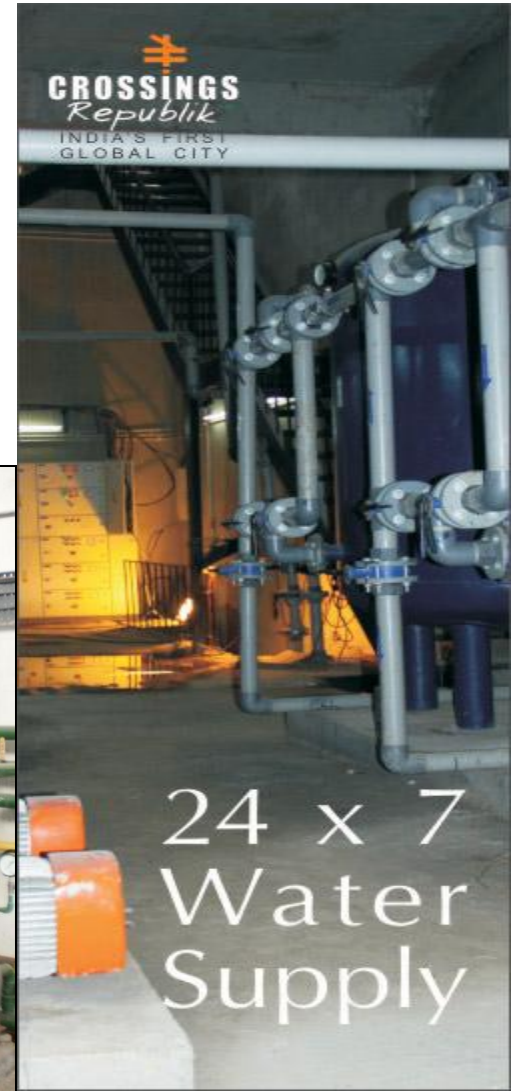
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STP:

Developed own

One STP of 1.2 MLd capacity based on FAB Technology for 2000 dwelling units.

Construction of STP for future extension is in progress..



24 x 7
Water
Supply



Advantages of FAB Technology

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1. Low on space. Since the Hydraulic Retention Time required for FAB based Plant is less, it saves on space required for bi-degradation process.
2. Since the HRT is lower and the volume of Aeration (FAB) Tank is lower, it is also a saving on the civil costs involved.
3. The FAB based plant can be operated successfully on as low as 40% of sewage inlet quantity.
4. Since the FAB based Plant has moving media in it, the maintenance of the plant is easy since access to submerged diffusers is possible without shutting down the plant.

Discharge:

- After treatment of sewage water sludge gets convert in to manures in form of 1" cube used for Horticulture.
- Treated Water used inform irrigation and flushing.

Under Ground water tanks:

Constructed - 300 KLd U/G water tanks for residential

as well as commercial purposes.

Abstraction of Water per day Through bore wells – 300 kLD.

Utilization: 10% used for drinking
 90% used for horticulture and
 flushing



□ **Rainwater harvesting System:**

Developed Recharge pits with desilting chambers – 50 nos.
30% storm water of catchment area pass through these Recharge pits.

□ **IGL :**

- Installed CNG & PNG Substation for both commercial as well as residential end users in order to save natural resources of Petroleum & oil.
- Networking of CNG as well as PNG gas pipe line laid up to 8 km.



□ **Energy saving:**

- The buildings have been designed & constructed in such a way as to use natural resources of light to its max. saving of power in day time.
- Establishment of electrical system with modern technique and equipments for both residential and commercial end users.
- Prepaid metering System – Optimum utilization of Electrical Energy.
- Installation of CSS – To reduce the energy loses and enhance the electrical load distribution system.
- Installation of GIS – For high tension distribution system based on latest technology.

Park/ Green Development:

- Golf Course developed with integrated lake - 37 acres
- Thick Green belt developed – 10,000 Trees and plantation
- Eco-Park developed – 5,000 Trees and plants
- Open space – Around 70% inside Township

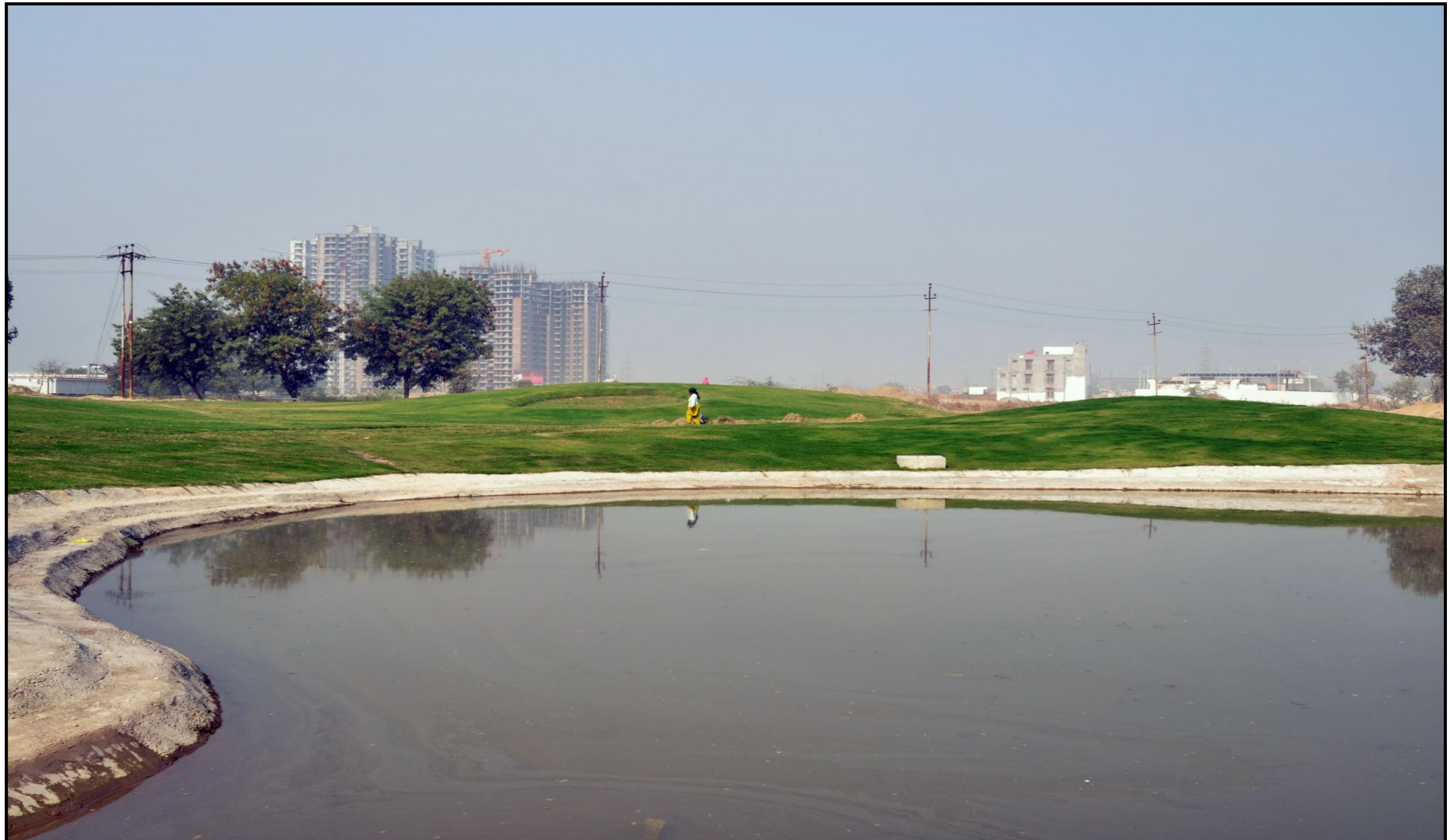
Thus Conserving the Bio-diversity of the Area.



View of Golf Course



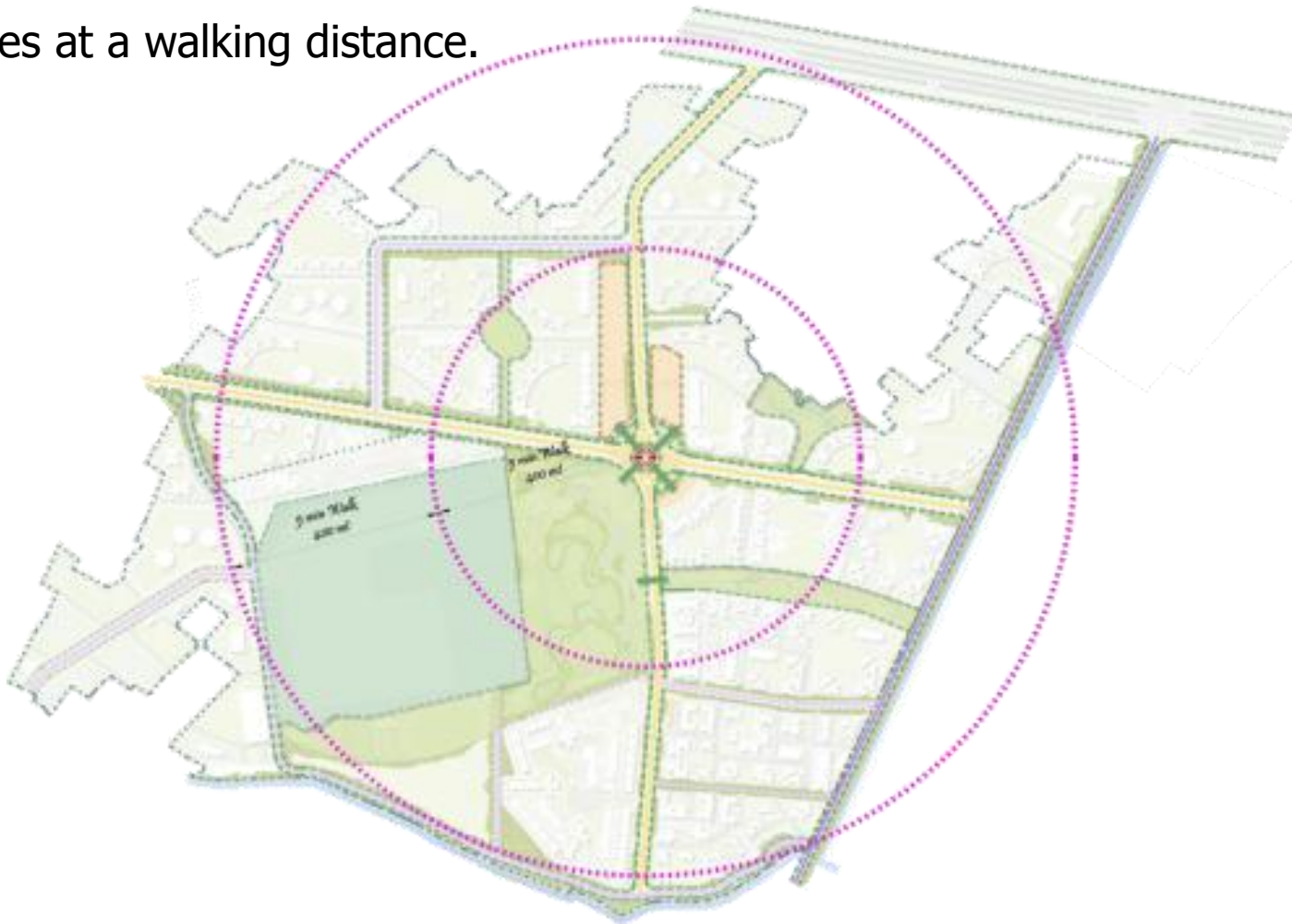
Artificial Lake



Public Amenities:

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1. All facilities at a walking distance.



5 to 10 minutes walking distance from main center of site

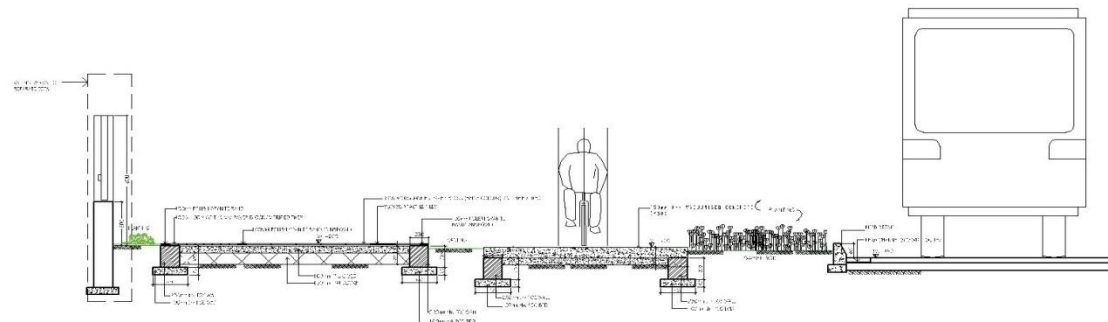
2. Pedestrian Walkways

- Dedicated sidewalks along all primary circulation roads have been designed
- Provision of pedestrian walkways, sidewalks, pedestrian plazas and promenade



3. Cycle Track:

- Use of Cycles inside the Township for Residents
- No vehicular movement inside township
- Saving of fuel
- Company is providing 300 nos. of cycles to promote healthy habits in order to provide natural & pollution free environment.



4. Internal Battery operated Vehicles :

Use of Battery operated Vehicles inside the township.

5. Garbage Disposal:

- Collection of garbage by well equipped dustbins based on latest technology.
- Separation of organic and inorganic garbage by the mechanized system developed inside the Township.

Cultural Amenities:

- ❑ Club Houses – To promote Social & Cultural Interaction
- ❑ Sports Stadium – To Promote Out Door Activities
- ❑ Lake Arcade - Place to relax for Residents & Specially Senior to Enjoy the Nature
- ❑ Golf Course – To Promote modern life style.

□ Village Integration:

- 8 Km. Road developed
- Developing Road network for better connectivity with the surrounding Villages.



Land Use



Total Area 360 Acres

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	Approx. Area	Approx. Proposed	Approx. LandScape Ground Coverage
	Area		
Residential	176 Acres	23 Acres	153 Acres
Shopping Malls	12 Acres	3 Acres	9 Acres
Schools	29 Acres	4 Acres	25 Acres
Hospitals	9 Acres	2 Acres	7 Acres
Greens	64 Acres	-----	64 Acres
Roads	45 Acres	-----	45 Acres
Public Facilities		8 Acres 7 Acres	1 Acres
w.s.Commercial	17 Acres	3 Acres	14 Acres
			324 Acres
			Total Landscape= 90%
of Township Area			

Total Area - 360 Acre

	Approx. Landscape Area	
□ Ground Coverage of Residential	6%	153 Acre
□ Shopping Malls	3%	9 Acre
□ Schools	2%	25 Acre
□ Hospitals	1%	7 Acre

Approx. Landscape 90% of Township Area

THANKS