KNOWLEDGE SERIES

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nzeb

net zero energy buildings

17th May, 2019

GREEN CONVERSATIONS:

UNNATI

Commercial office building for GCPL, Greater Noida

EXPERT PANEL

SESSION MODERATOR

DEEPA PAREKH
Sr. Project Manager
Environmental Design Solutions

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KNOWLEDGE SERIES
May | June | July 2019

EXPERT PANEL

ASHOK LALL
Owner
Ashok B Lall Architects

VEVAIK MAHAJAN
Managing Director
UEDC

MARIYAM ZAKIAH
Sr. Green Building Analyst
Environmental Design Solutions

INTRODUCTION

INTRODUCTION

Office building for GAINWELL CAT

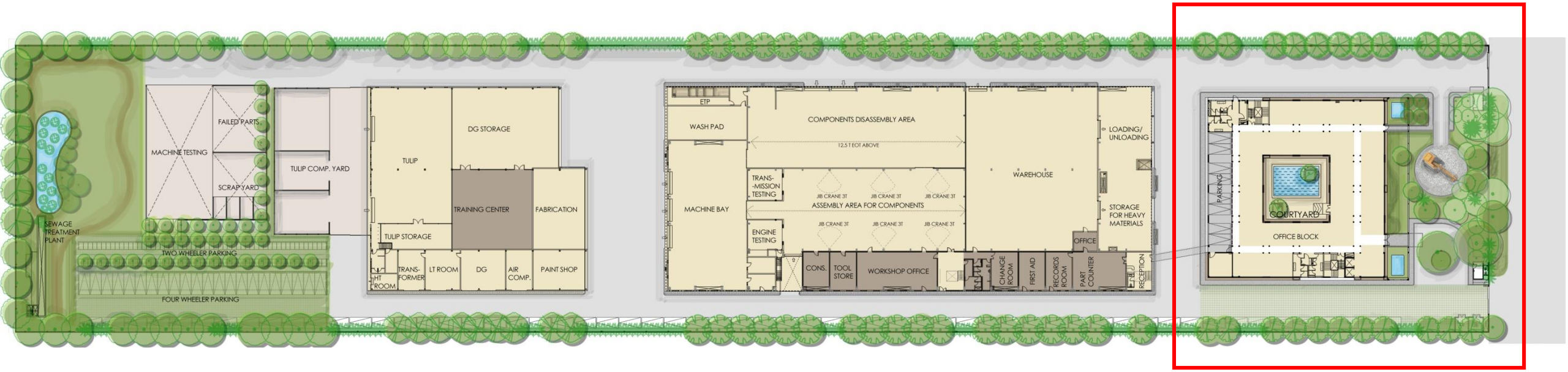
Located in Greater Noida (composite climate)

Construction completed in 2018

3 storey with an area of 4,945 sq.m (53,208 sft)

part of 5 acre Industrial campus

Site



D.G. SHED
Built Up Area : 2200 sq.m

WORKSHOP
Built Up Area : 6340 sq.m

OFFICE
Built Up Area : 4945 sq.m

RECOGNITIONS

ECBC Compliant

1st building in India to achieve Platinum certification under LEEDv4 BD+C: NC rating system

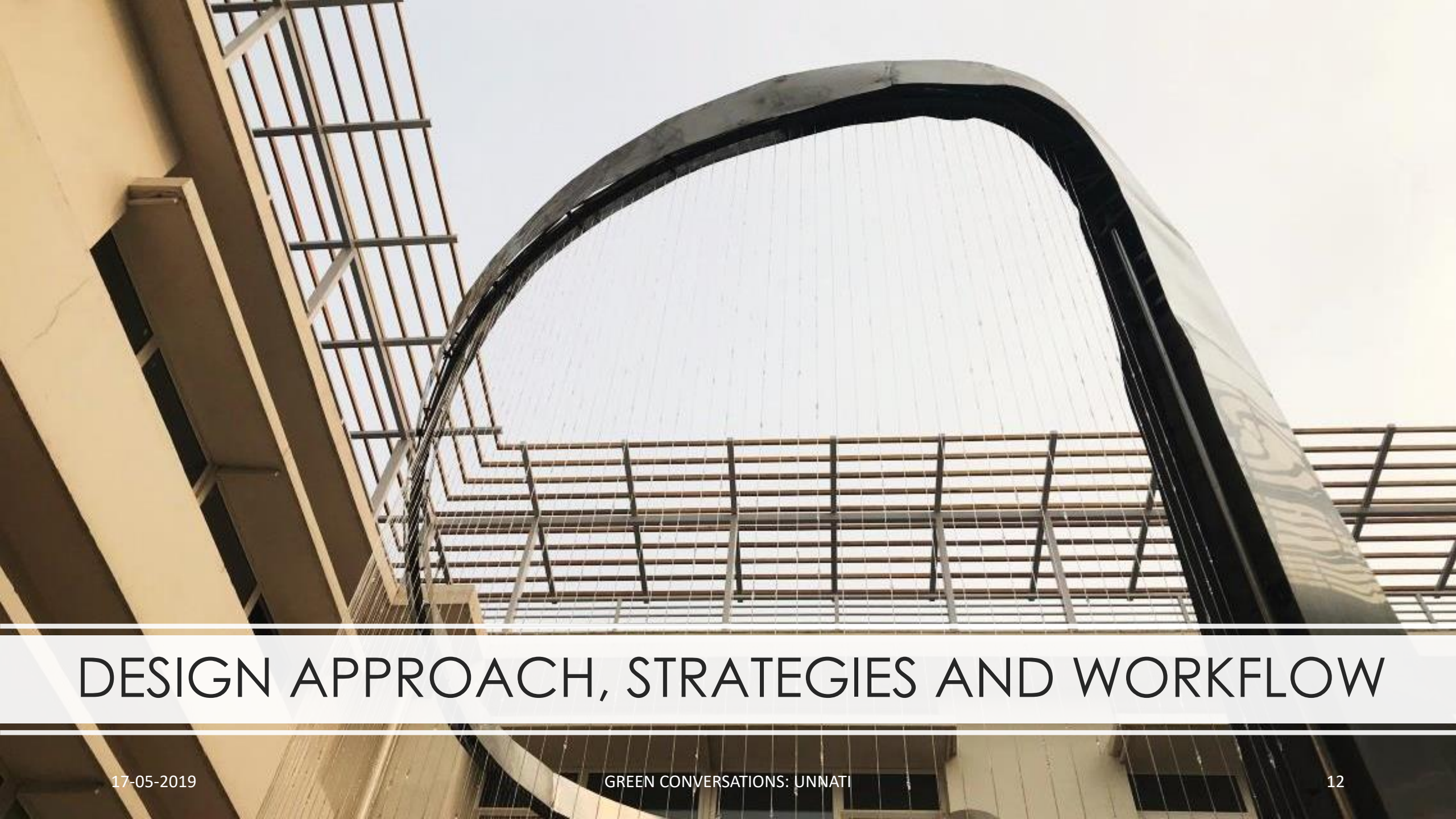
WHY ARE WE TALKING ABOUT THIS PROJECT?

WHY ARE WE TALKING ABOUT THIS PROJECT?

- High-performance building design
- Integrated design approach
- Climate responsive building design
- Low energy cooling system

CLIENT VISION

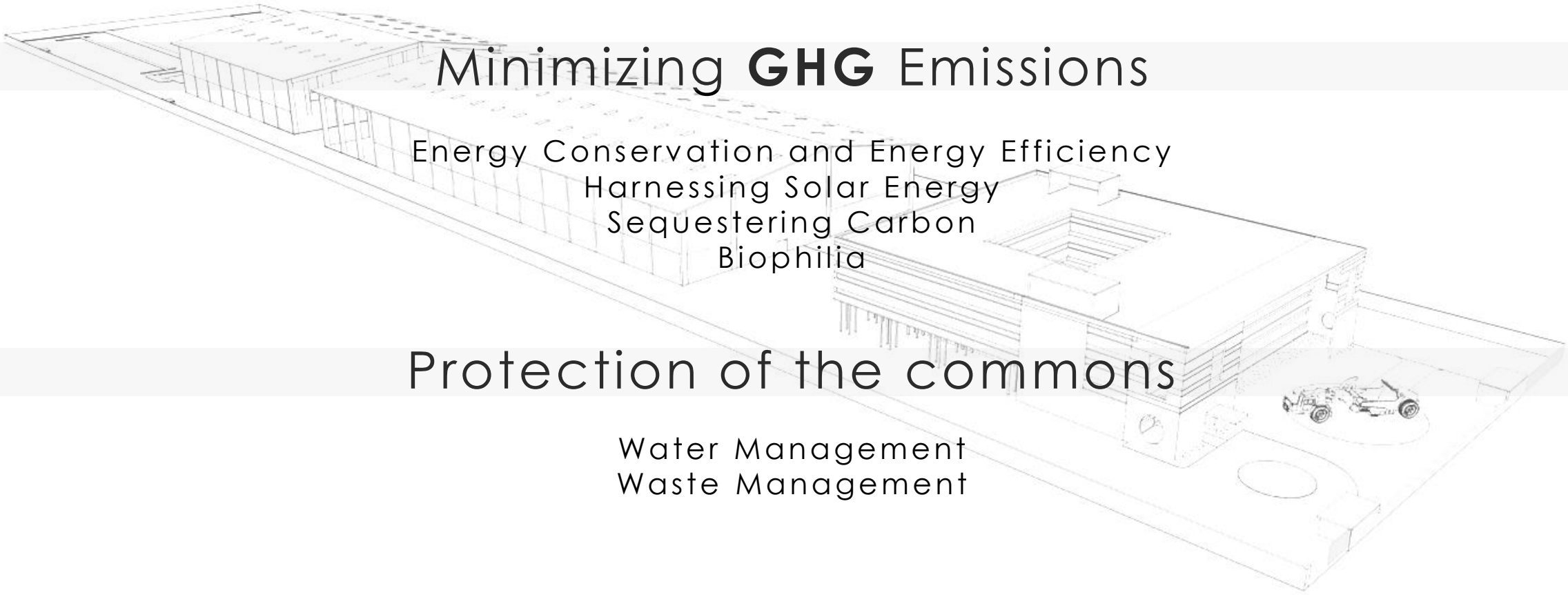
Develop a world-class facility for their employees that is **ecologically responsible**



DESIGN APPROACH, STRATEGIES AND WORKFLOW

Environmental responsibilities

To produce a safe, healthy and productive work place at minimum impact on the Environment.



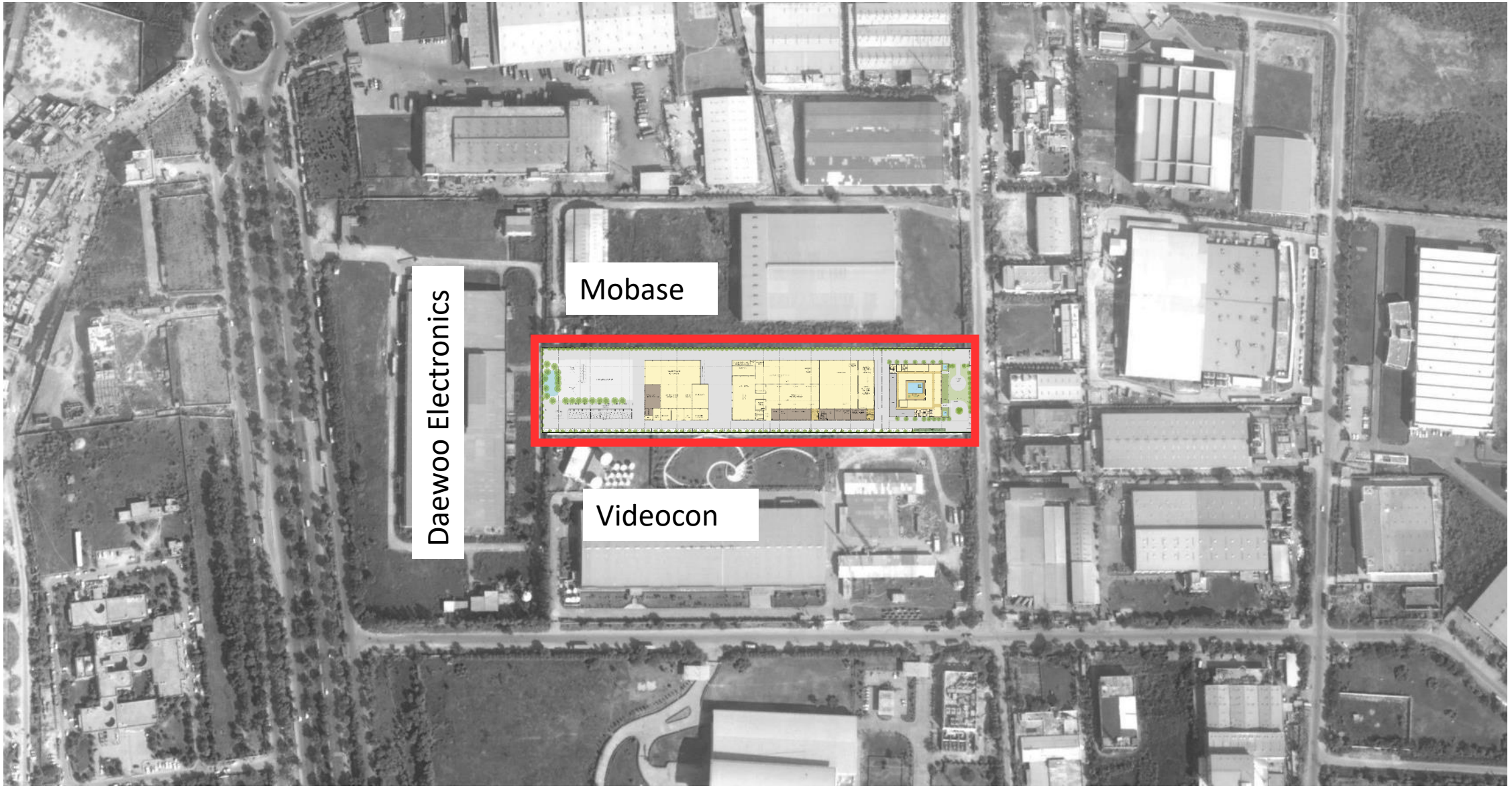
Minimizing **GHG** Emissions

Energy Conservation and Energy Efficiency
Harnessing Solar Energy
Sequestering Carbon
Biophilia

Protection of the commons

Water Management
Waste Management

Site

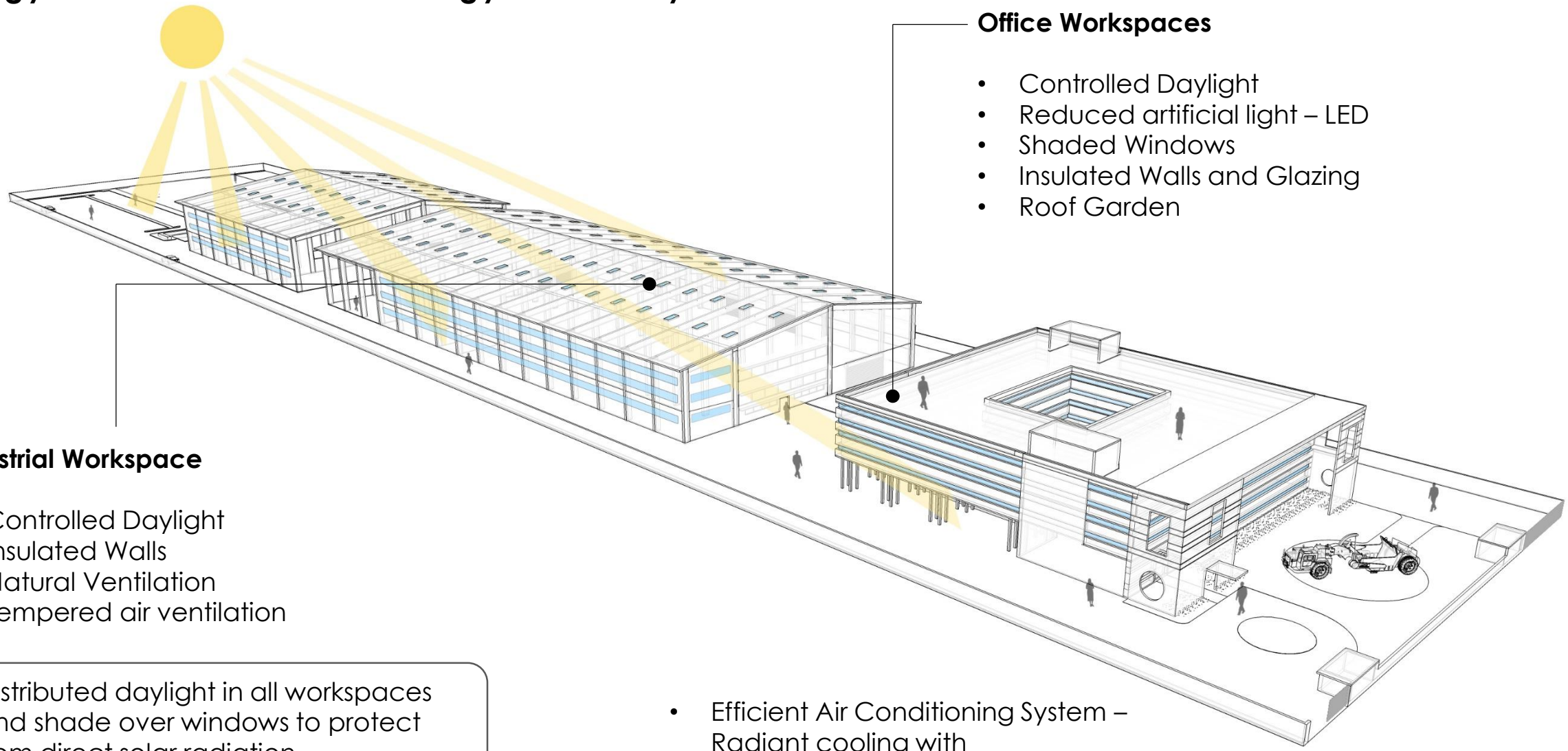


Site Area : 20910 sq.m

328 x 63.75 m

Environmental responsibilities

Energy Conservation and Energy Efficiency



Office Workspaces

- Controlled Daylight
- Reduced artificial light – LED
- Shaded Windows
- Insulated Walls and Glazing
- Roof Garden

Industrial Workspace

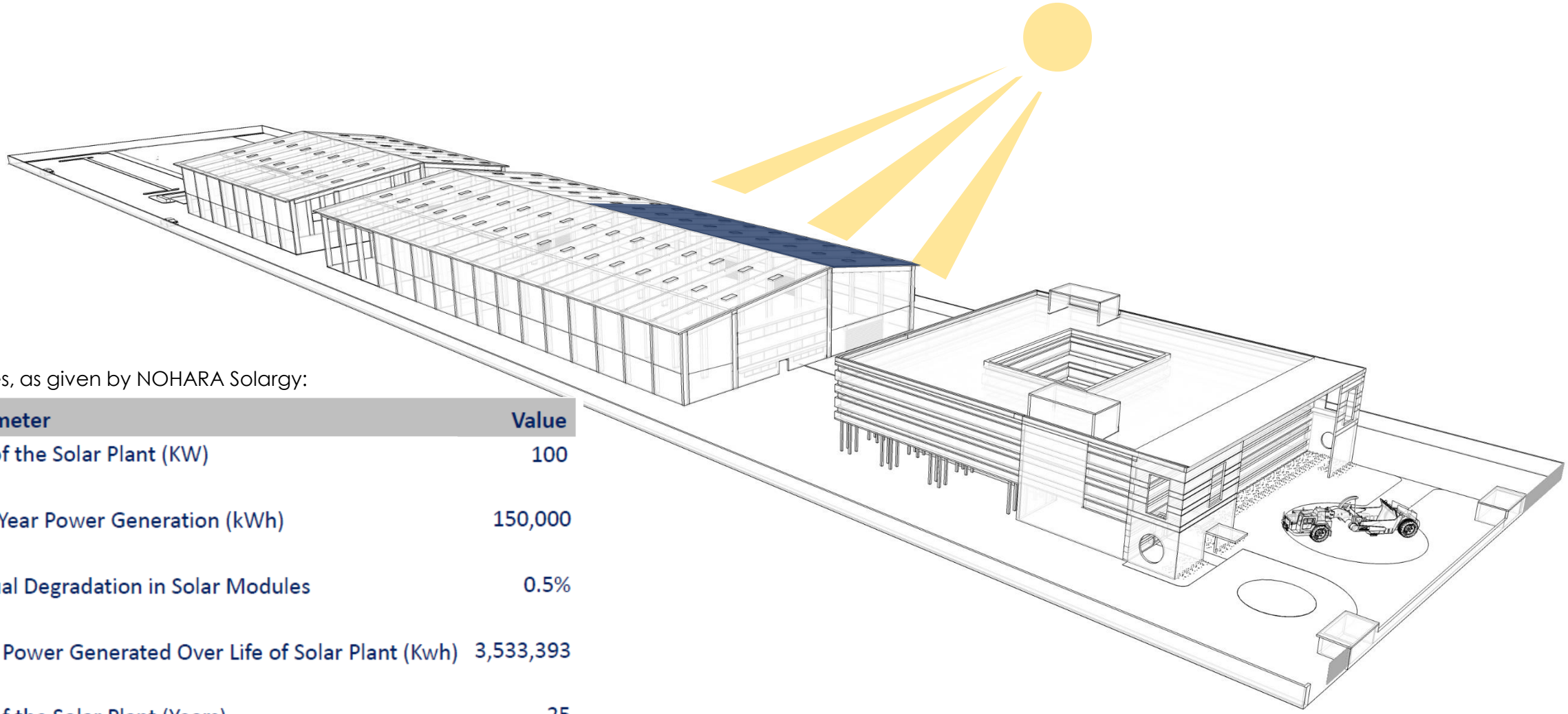
- Controlled Daylight
- Insulated Walls
- Natural Ventilation
- Tempered air ventilation

Distributed daylight in all workspaces and shade over windows to protect from direct solar radiation

- Efficient Air Conditioning System – Radiant cooling with tempered fresh air

Environmental responsibilities

Harnessing Solar Energy

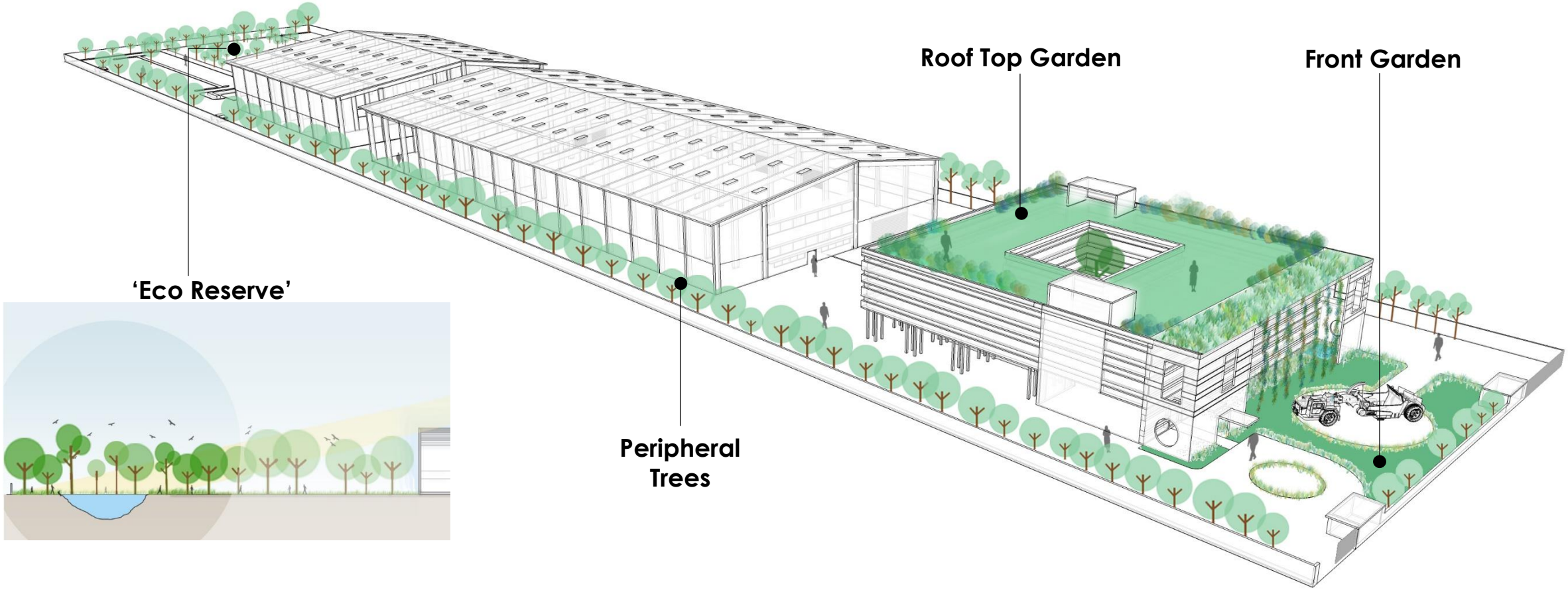


Figures, as given by NOHARA Solargy:

Parameter	Value
Size of the Solar Plant (KW)	100
First Year Power Generation (kWh)	150,000
Annual Degradation in Solar Modules	0.5%
Total Power Generated Over Life of Solar Plant (Kwh)	3,533,393
Life of the Solar Plant (Years)	25

Environmental responsibilities

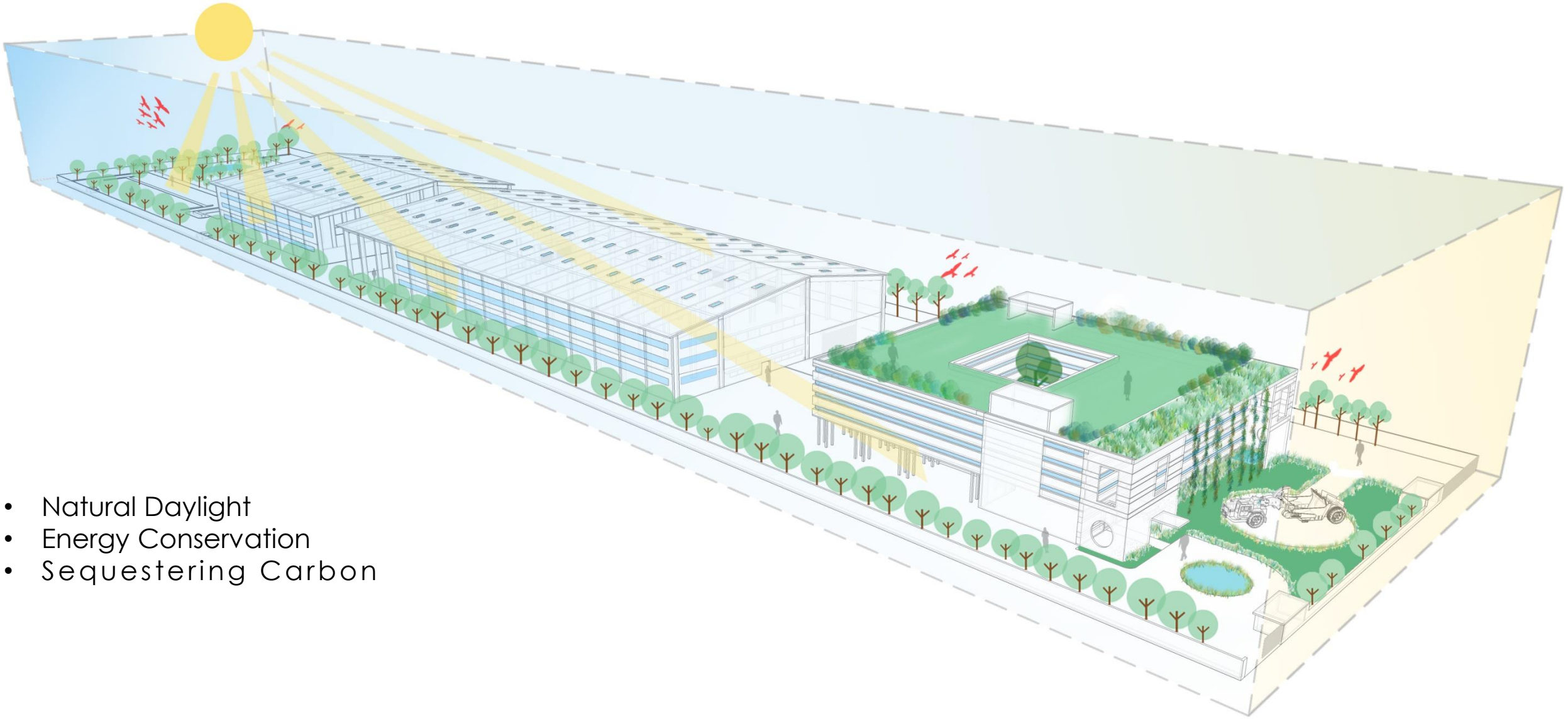
Sequestering Carbon



Maximum opportunities for green foliage

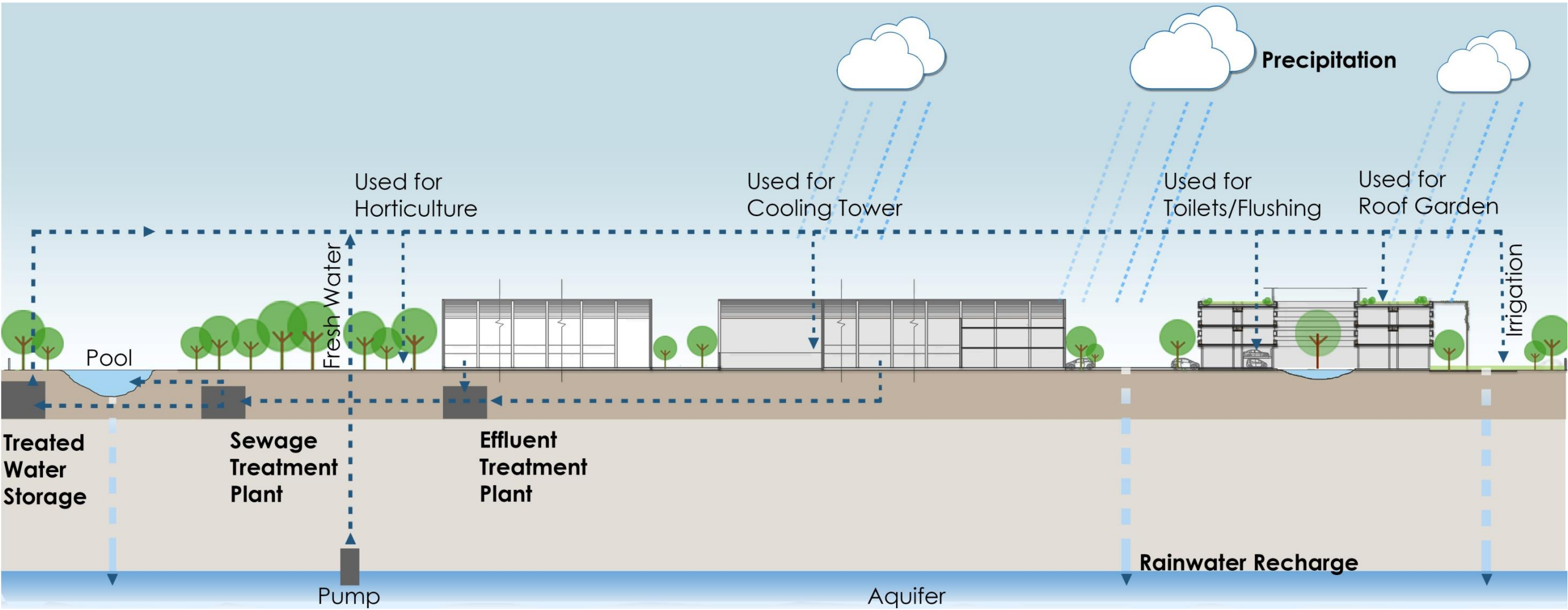
Environmental responsibilities

Integrated System



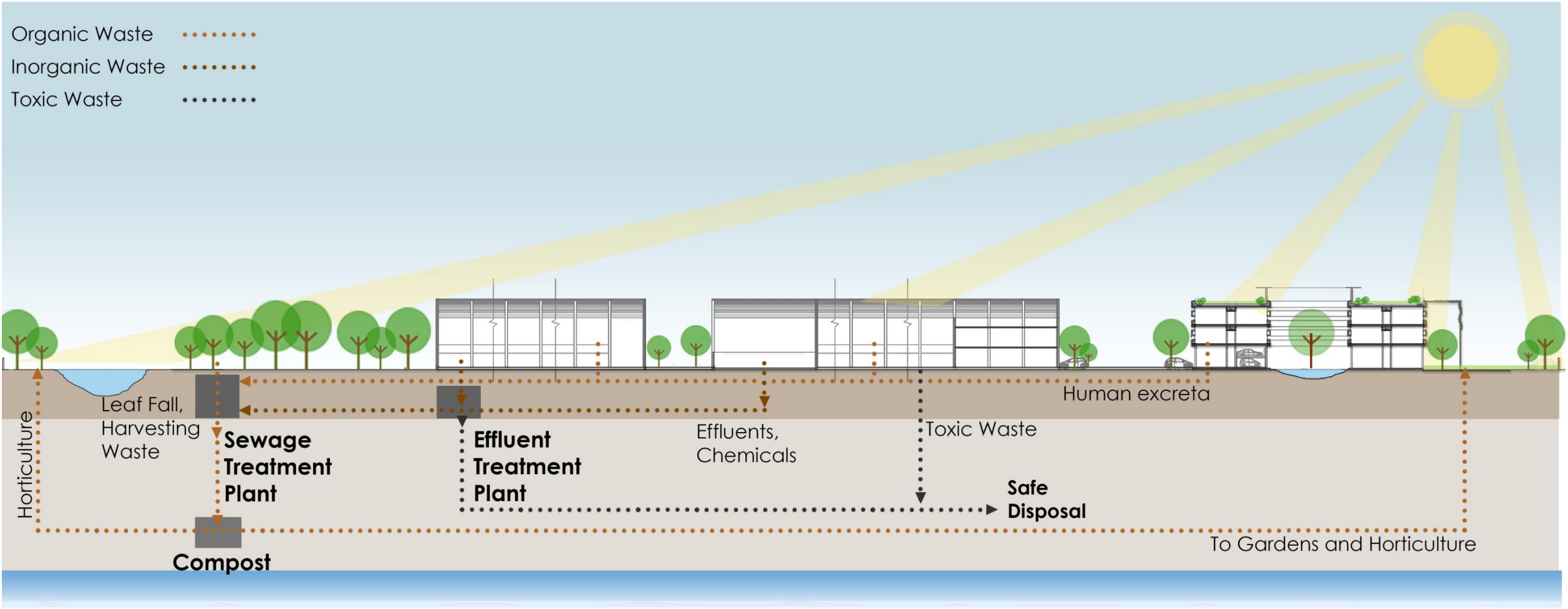
- Natural Daylight
- Energy Conservation
- Sequestering Carbon

Water Management



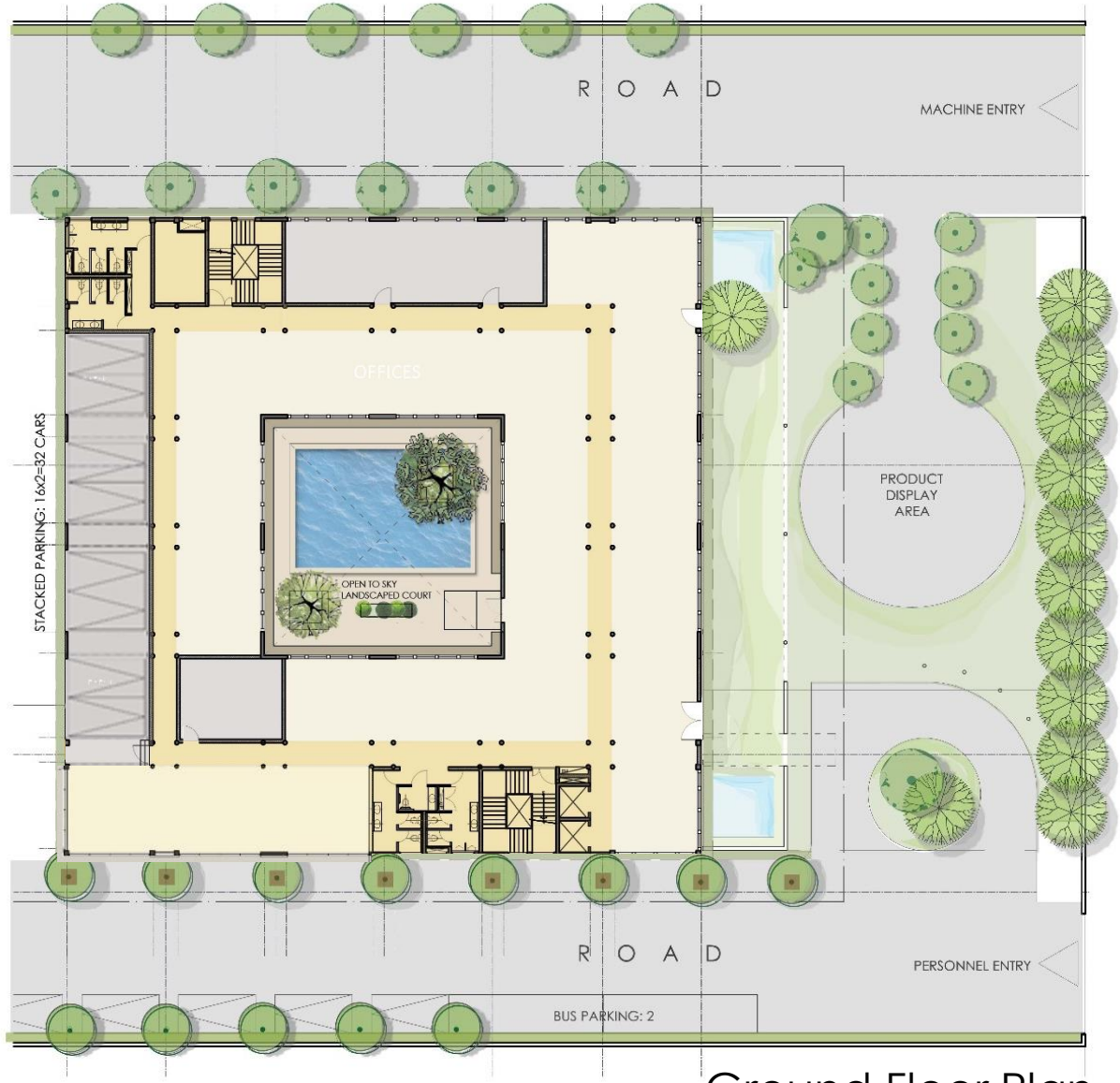
Harvest, Conserve, Treat/Clean, Reuse

Waste Management



Organic Waste to compost, Inorganic Waste to recycling trade, Toxic waste to safe disposal

OFFICE - Plans

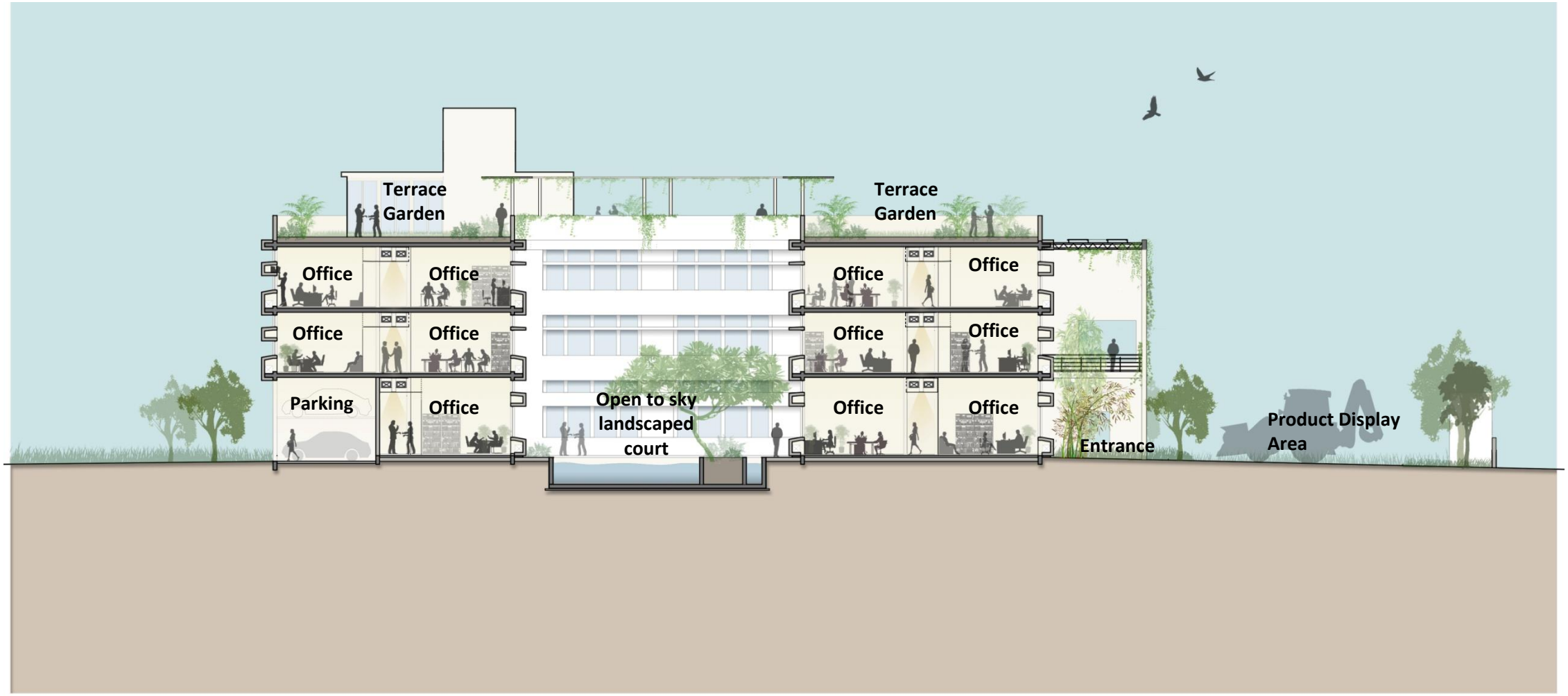


Ground Floor Plan

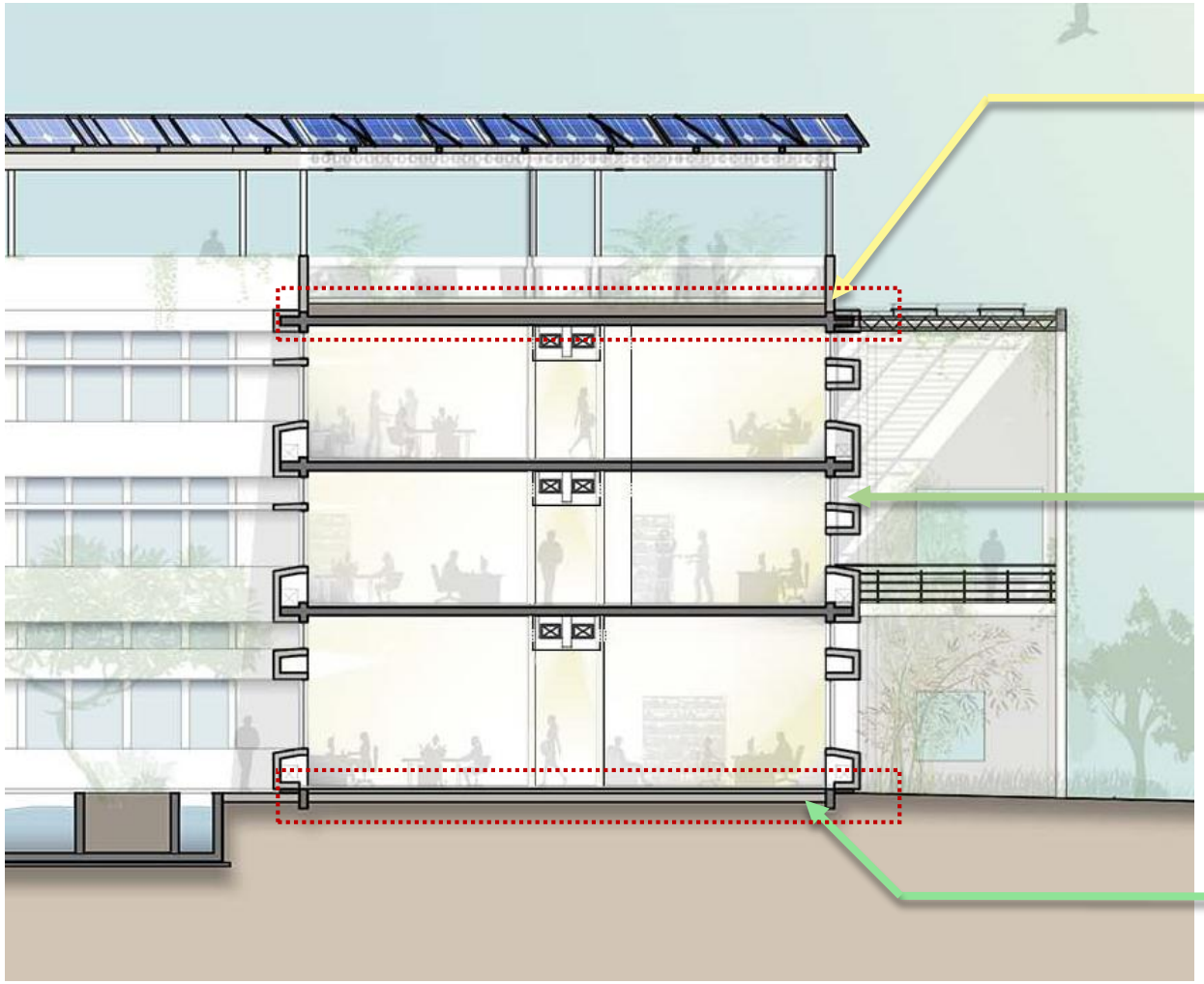
First Floor Plan

Second Floor Plan

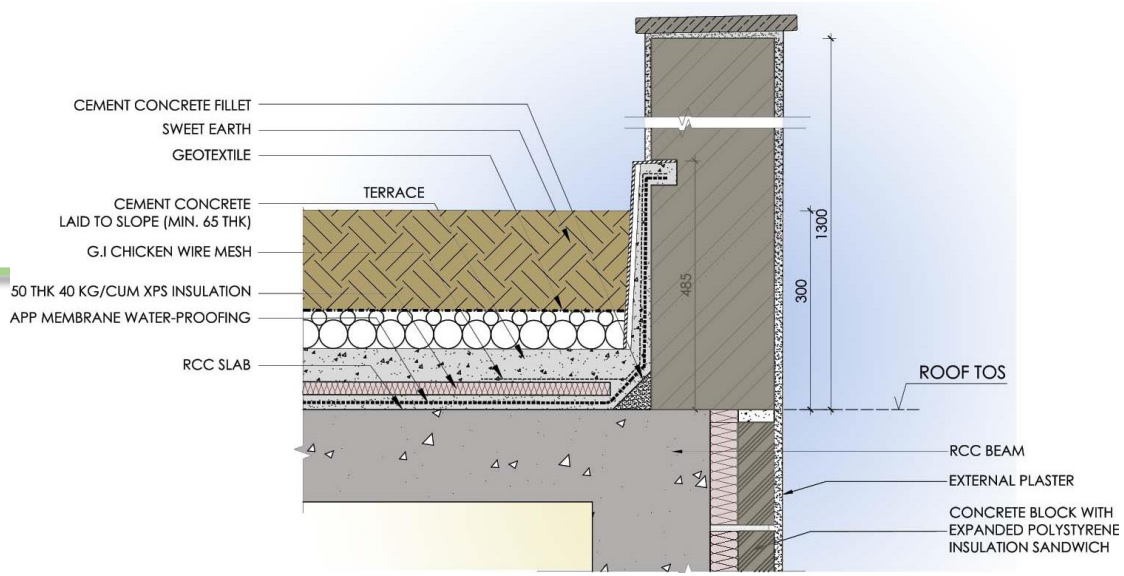
OFFICE - Section



OFFICE – Building Envelope
Overall Building

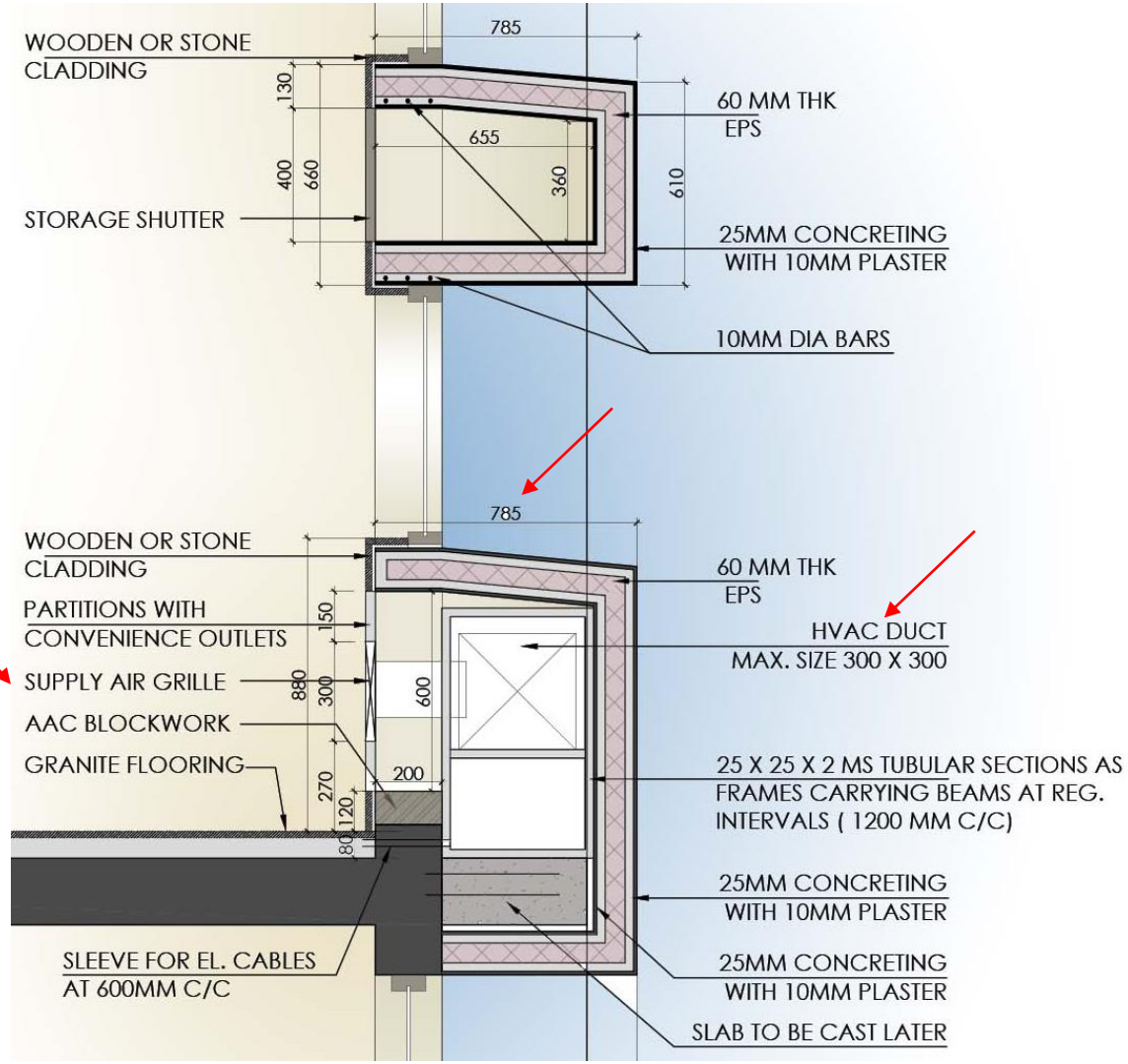


TERRACE GARDEN
Insulates the building structure against heat ingress from the roof



BASE INSULATION
Insulates the building structure against losing heat or coolth to the ground

OFFICE – Building Envelope
Wall Insulation



Truss Reinforced Insulated Concrete Eco-Wall developed by **Braj Green Product**, India

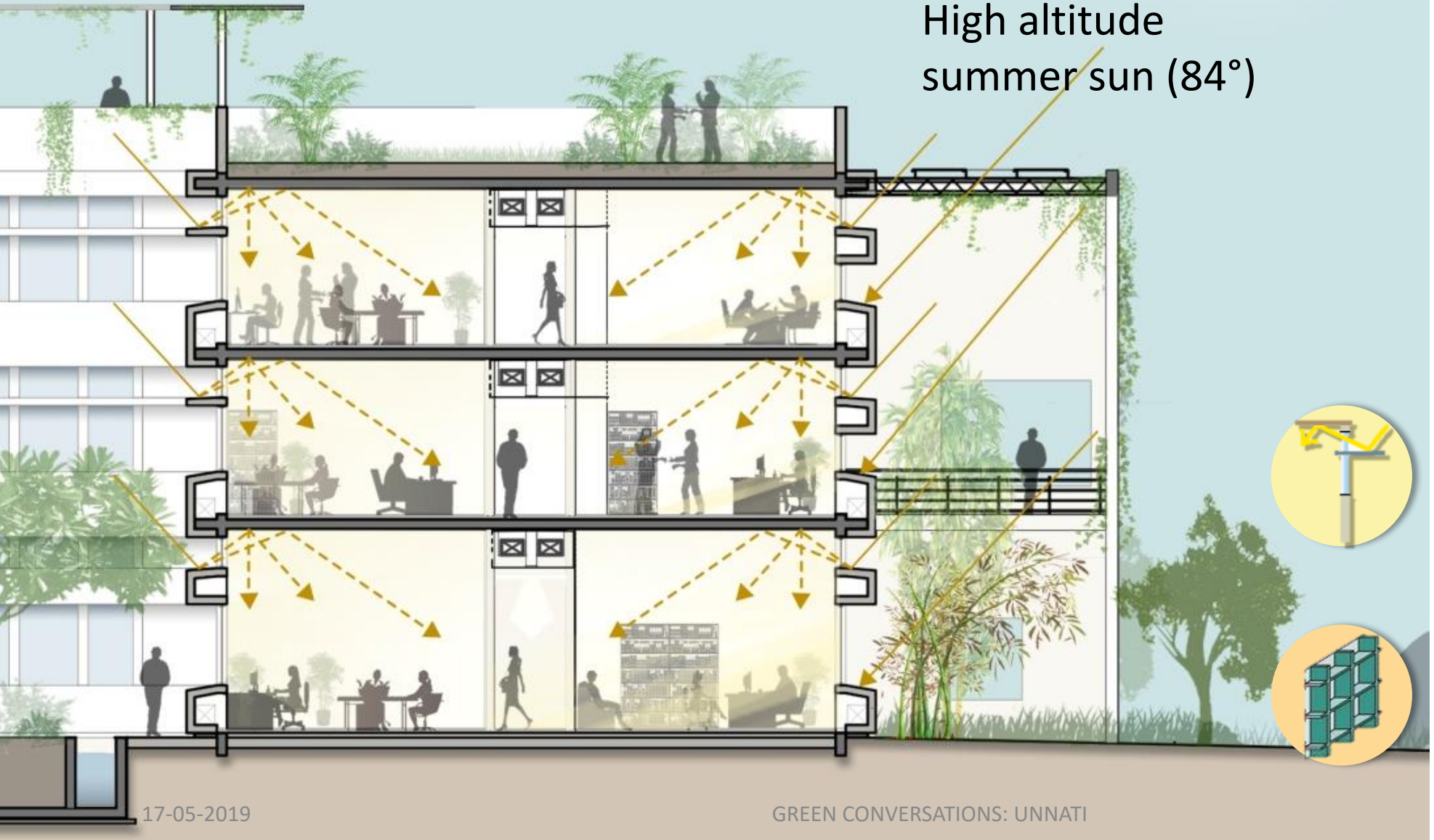
- Ensures quick construction
- EPS is almost impermeable having a mere 2% water absorption
- Fire rating of over 2 hours with a 2" protective cover of concrete on either side
- Effective sound attenuation(Sound transmission class of above 50STC)
- Structurally sound system of construction

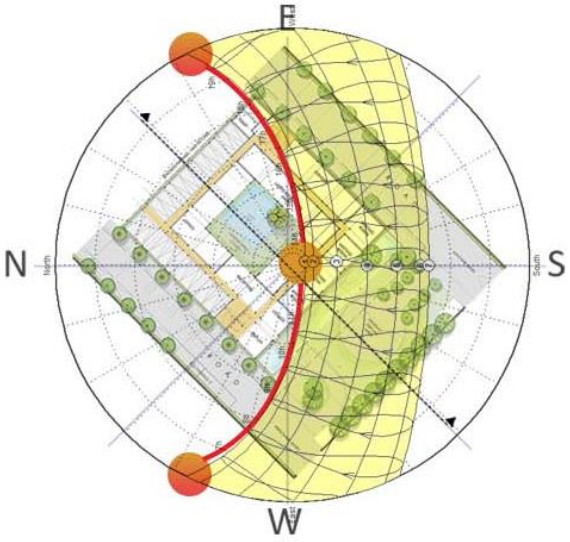
Initial Installation

Concrete Spraying

OFFICE – Daylighting
Summer Season

High altitude
summer sun (84°)

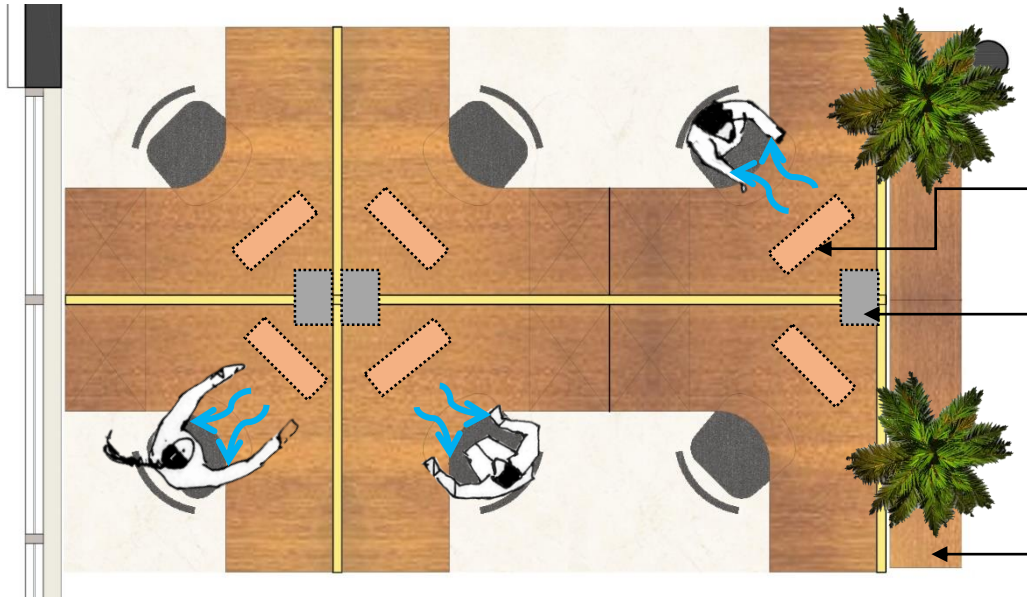




LIGHT SHELF
Distributes glare-free daylight into the depths of the habitable spaces

SHADING DEVICE
Shading against direct solar radiance is provided by overhangs and projections

Office Workstations

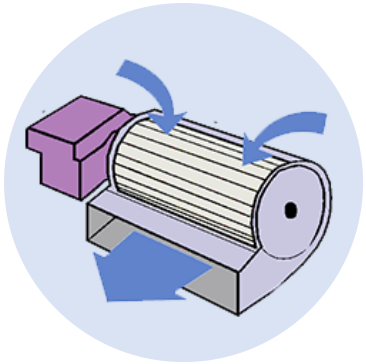


Personal Cross-flow fans under each desk

Individually controlled Task lighting

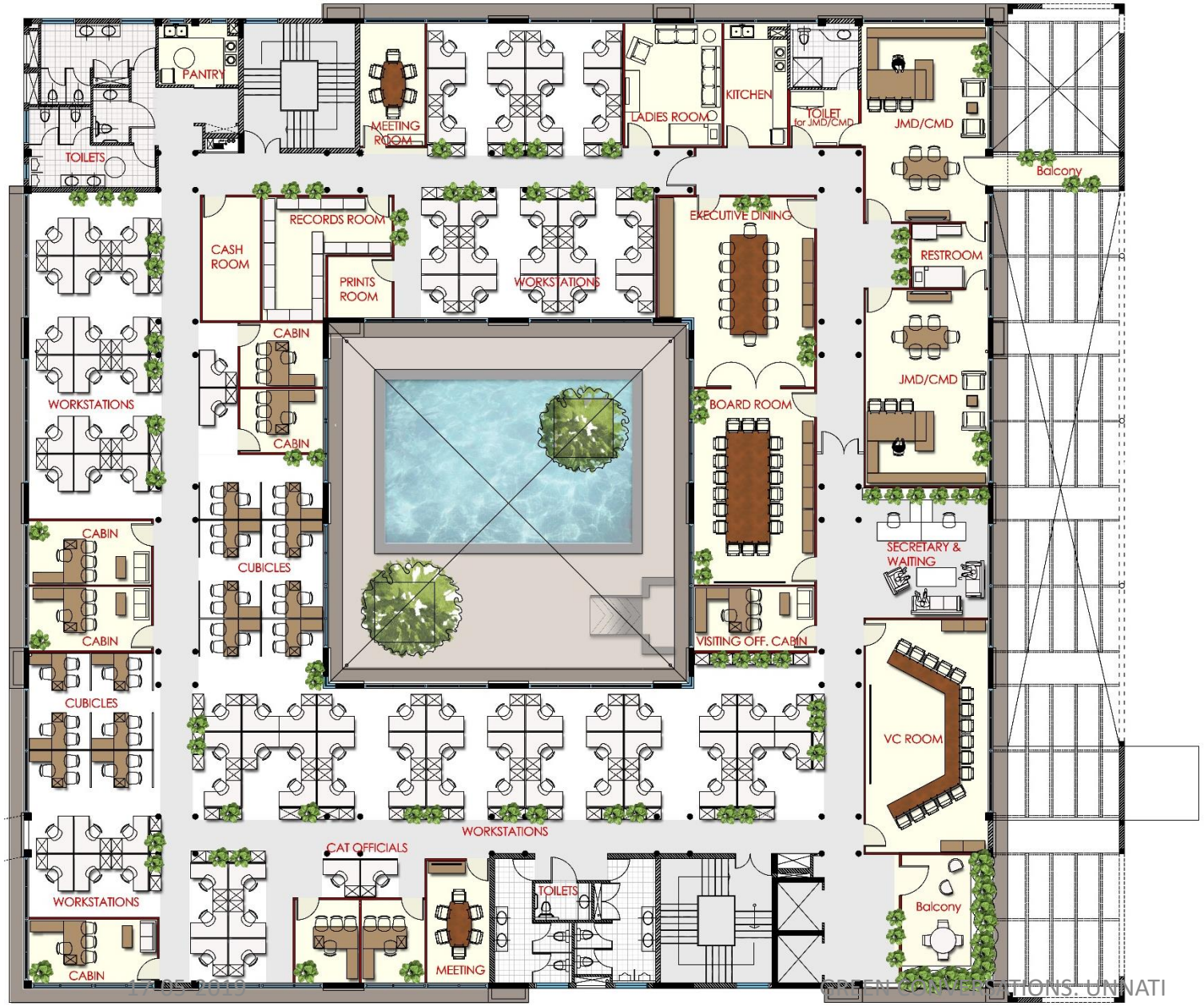
STORAGE CABINETS (Towards the corridor)

Workstation Plan - Cluster of 6



CROSS FLOW FAN

First Floor Plan – Office layout

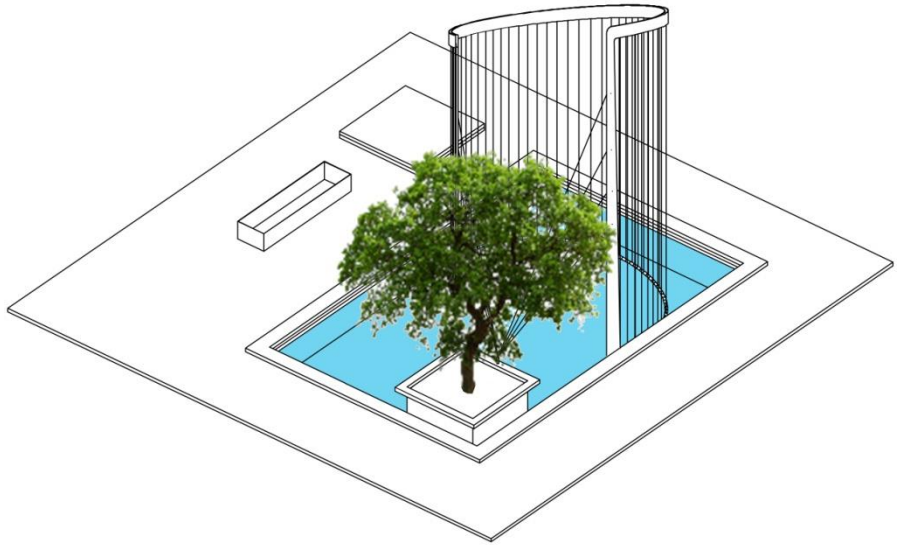


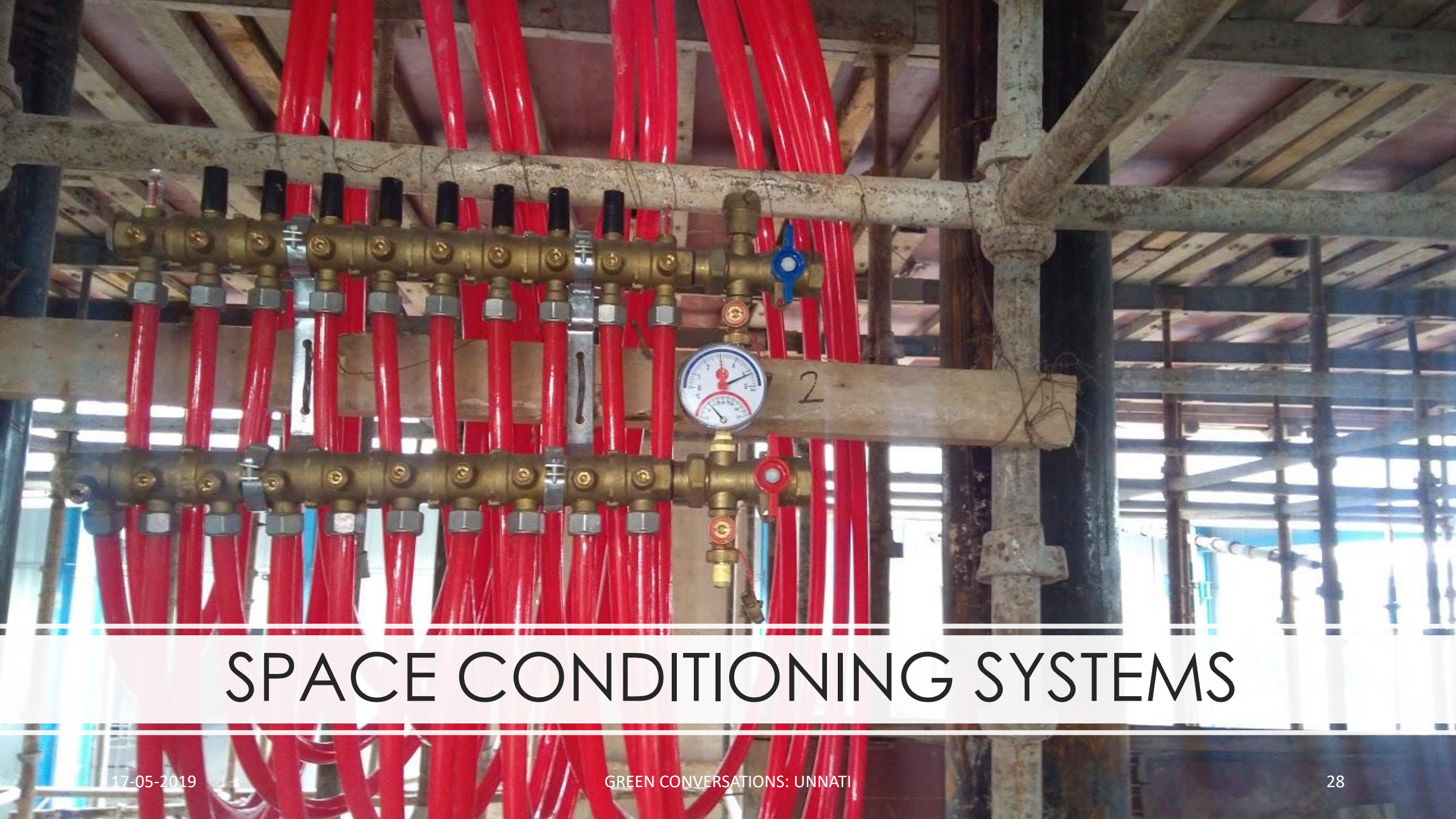
Circulation space

Circulation space

Cabins + Rooms

Open office





SPACE CONDITIONING SYSTEMS

DESIGN EXPLORATION PROCESS

VRV

TOTAL TR: 160 TR

CHILLED WATER VAV

TOTAL TR: 120
ALL AIR SIDE - 120 TR

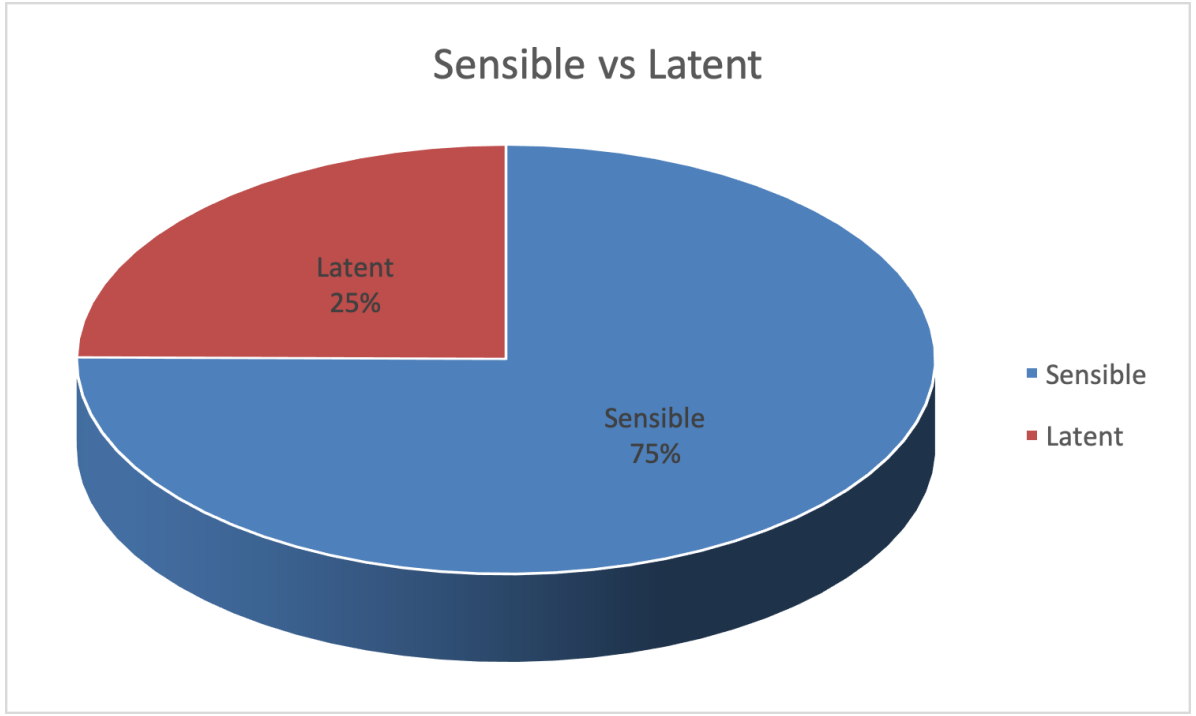
OPERATIONAL ENERGY SAVINGS OF 10% OVER VRV

CHILLED WATER W/RADIANT + DISPLACEMENT VENTILATION

AVG: 100 TR (INSTALLED)
RADIANT: 60 TR
AIR SIDE: 40 TR

OPERATIONAL ENERGY SAVINGS OF MIN. 30% OVER VRV

DESIGN EXPLORATION PROCESS

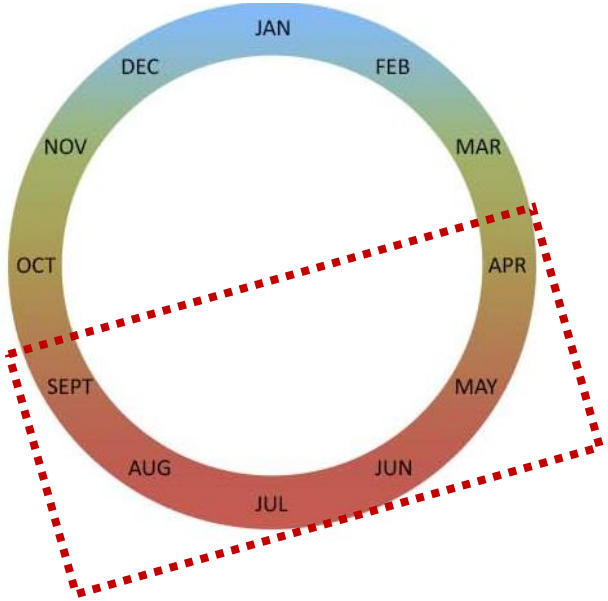


The space has high sensible part that makes radiant cooling viable

RADIANT COOLING SYSTEM


2

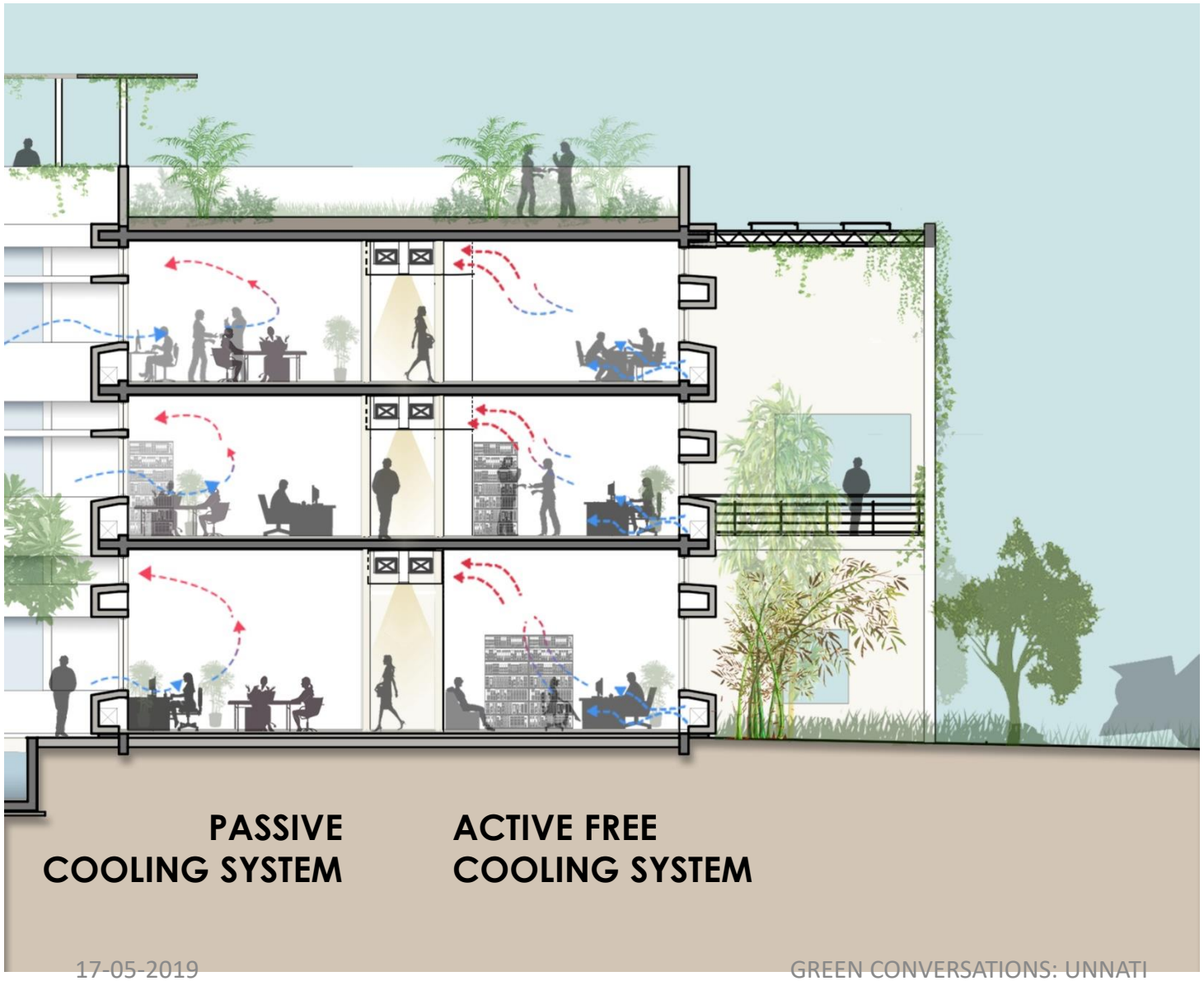
OFFICE – Active cooling system

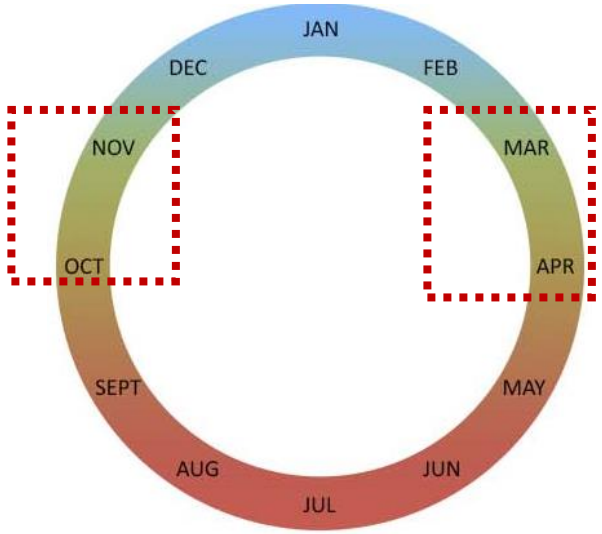


RADIANT COOLING
Radiant cooling handles the sensible heat load

FRESH AIR DUCTED SUPPLY
Fresh air supply also handles the latent heat load

OFFICE – Passive cooling/ Active Free Cooling

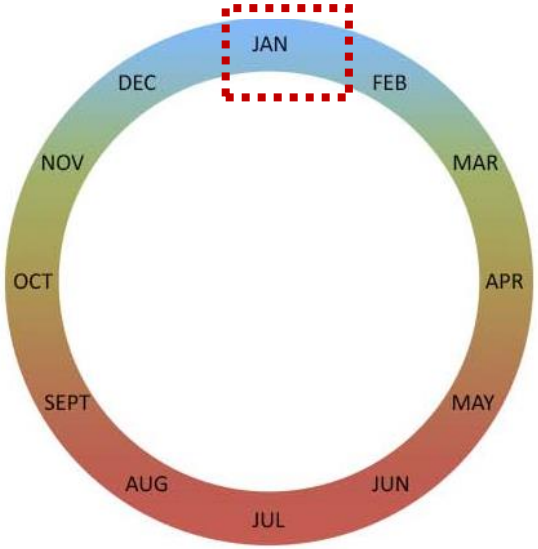




NATURAL VENTILATION
Windows on opposite walls induce natural ventilation

MECHANICALLY AIDED VENTILATION
Used when natural ventilation is inadequate even in cool weather

OFFICE – Radiant Heating System



RADIANT HEATING
The pipes in the slab circulate heated water, thus warming the interiors

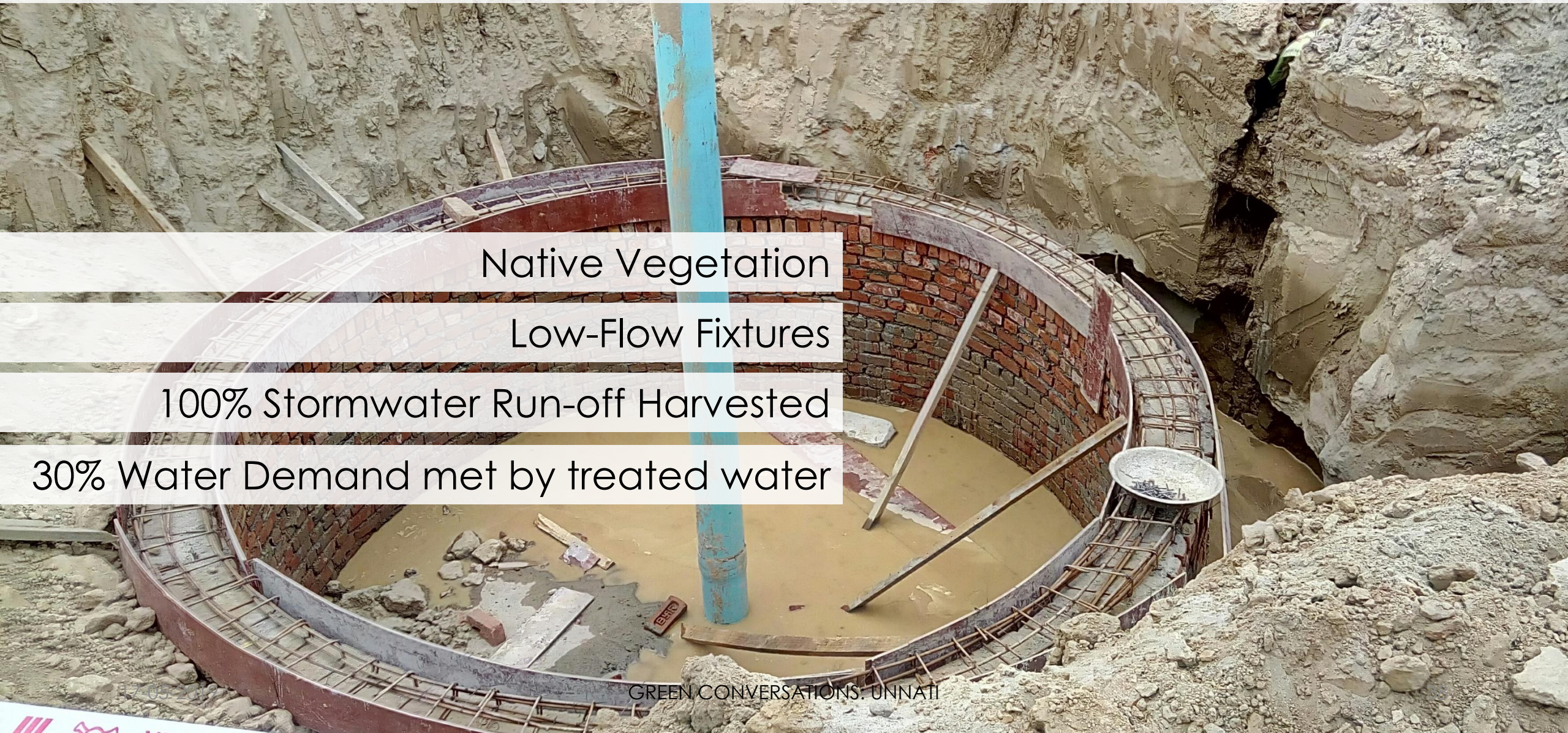
FRESH AIR DUCTED SUPPLY
Provides tempered fresh air

GREEN BUILDING FEATURES

ENERGY EFFICIENT DESIGN

- Truss Reinforced Concrete Wall Panels
- Green Roof – Insulation & Reduce run-off
- Double Glazed Windows
- Radiant Cooling System
- Building Management System
- 90% Spaces-access to Daylight & Views
- LCA Assessment to meet LEED compliance
- Envelope Commissioning

REDUCE, REUSE, RECYCLE



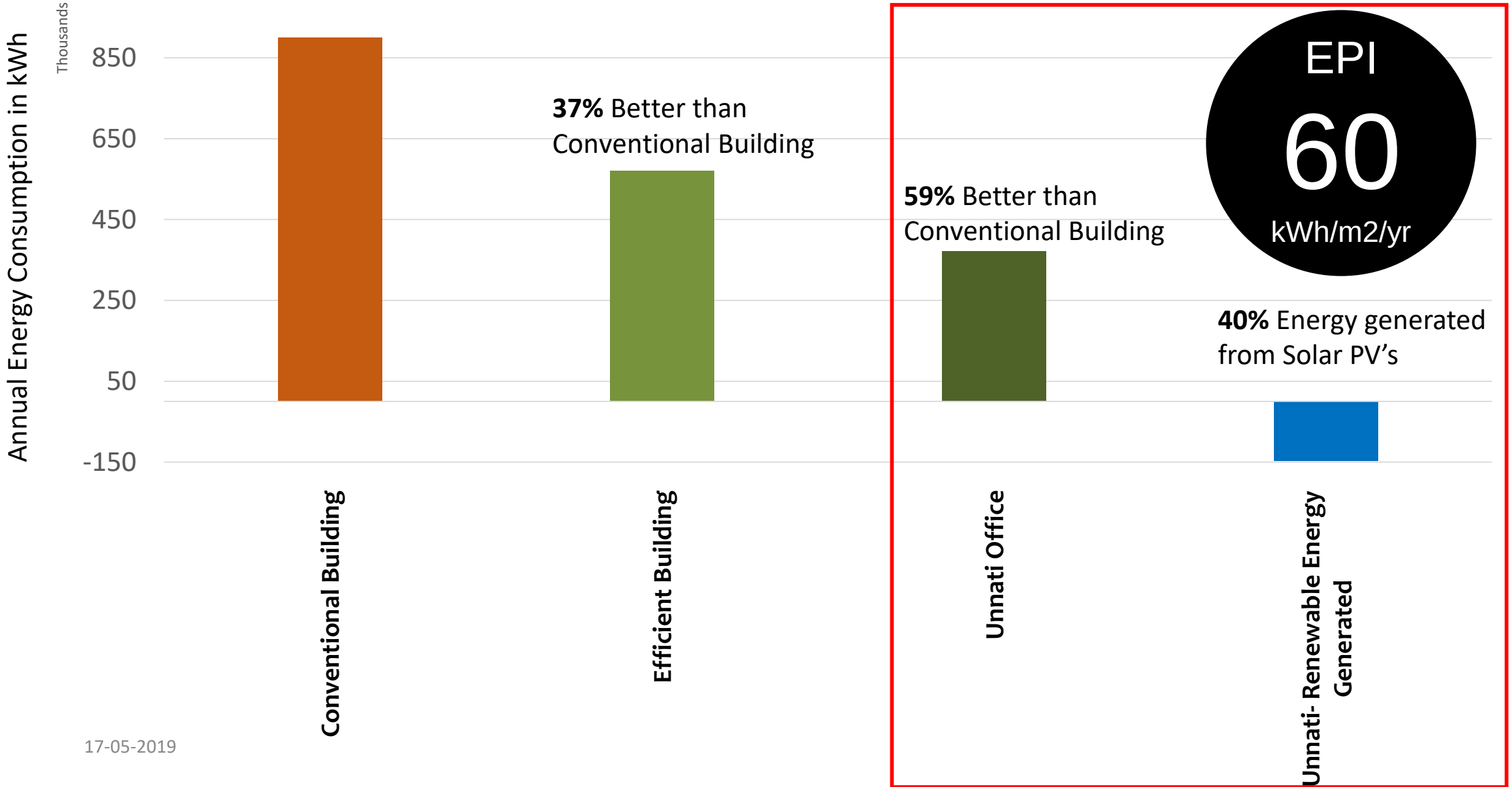
Native Vegetation

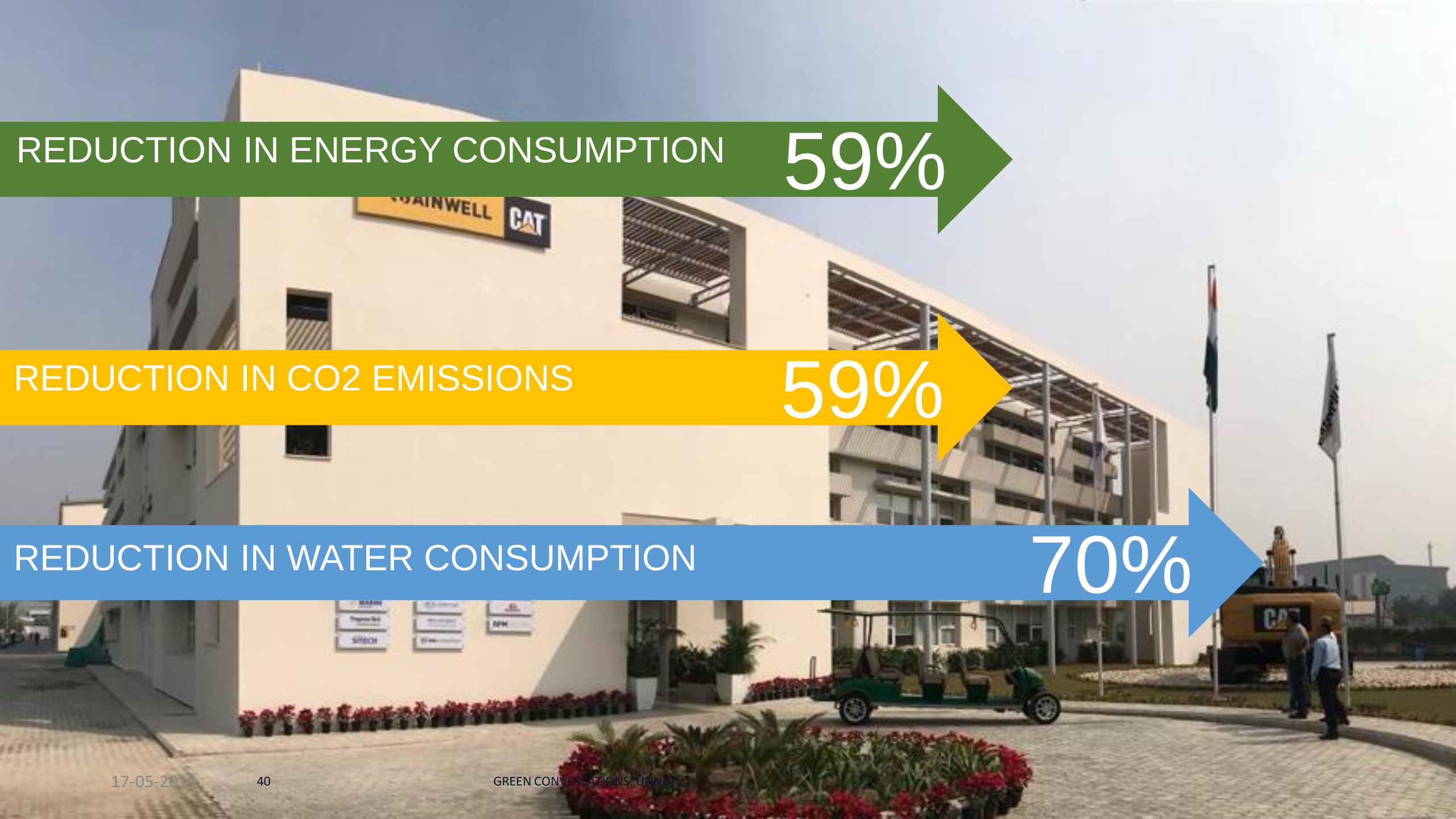
Low-Flow Fixtures

100% Stormwater Run-off Harvested

30% Water Demand met by treated water

Comparison of Energy Consumption (kWh)




REDUCTION IN ENERGY CONSUMPTION
59%
REDUCTION IN CO2 EMISSIONS
59%
REDUCTION IN WATER CONSUMPTION
70%

LEED SCORE 89(110) Points

1/1

INTEGRATIVE PROCESS

15/16

LOCATION AND TRANSPORTATION (LT)

8/10

SUSTAINABLE SITES (SS)

10/11

WATER EFFICIENCY (WE)

30/33

ENERGY AND ATMOSPHERE (EA)

5/13

MATERIALS AND RESOURCES (MR)

10/16

INDOOR ENVIRONMENTAL QUALITY (EQ)

6/6

INNOVATION (IN)

4/4

REGIONAL PRIORITY (RP)

CHALLENGES

APPROACH TO SUSTAINABLE DESIGN, VALUE-ADD, EASE OF OPERATIONS,

FAVOURITE DESIGN FEATURE, ELEMENT, STRATEGY


WHO
WHEN
WHERE
HOW
WHY
WHAT

END OF WEBINAR

Show us a great daylit space!

It has to be **a pic that YOU have taken**

Share it on social media with location & **#nzebindia** by

26th May, 2019

The Winner will get featured !!!

#nzebindia contest


Airtel 3G 2:02 PM 95%
Instagram
prachighatwai
prachighatwai #nzebindia
6 SECONDS AGO
(4) Facebook
https://www.facebook.com
Search
Prachi Ghatwai
News Feed
Messenger
Shortcuts
Net Zero Energ...
Explore
Pages
Events
Fundraisers
See more...
Create post
#nzebIndia Daylight flooding
LPQ, Powai, Mumbai
With
Who were you with?
Photo/Video
Tag friends
News Feed
Your story
See More
Share
DON'T FORGET TO #nzebindia

28th May, 2019@4PM

GREEN CONVERSATIONS:

MNRE HEADQUARTERS, DELHI

EXPERT PANEL:

Bedanta Saikia, EDIFICE CONSULTANTS

Samdarsh Nayyar, SNC

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May | June | July 2019

THANK YOU !

MAITREE

MARKET INTEGRATION AND TRANSFORMATION FOR ENERGY EFFICIENCY