

# *Eco-Productive Building Design*

From an urban practice

# Biome

is a small practice established in 1990 in Bangalore since last 20+ years has designed 500 ecological projects of various sizes.....

For a building to be eco-productive it has to address following concerns of environment and living ....

1.Resource

2. Water

3.Energy

4.Food

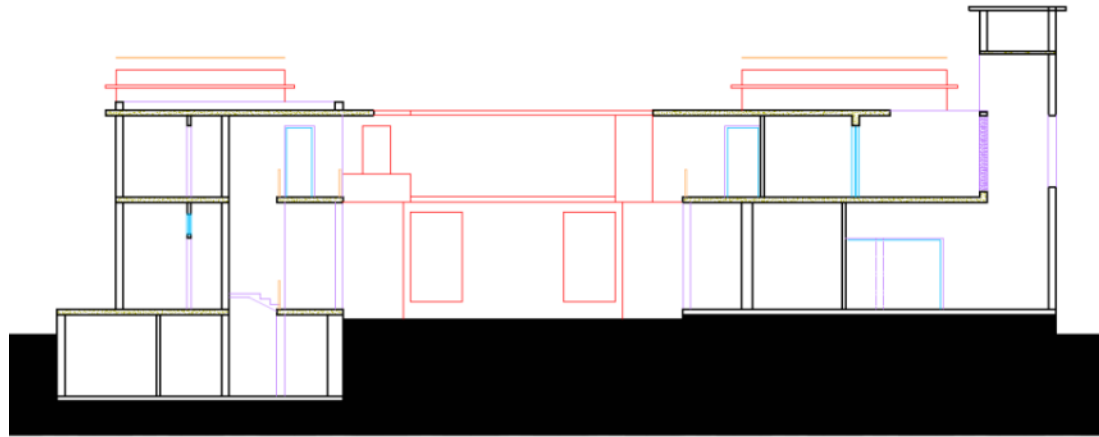
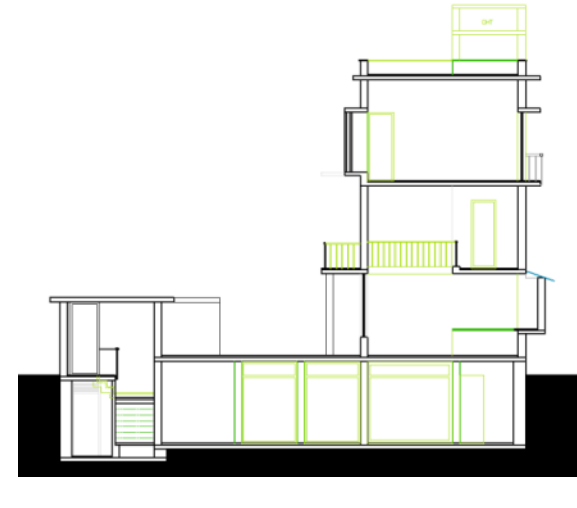
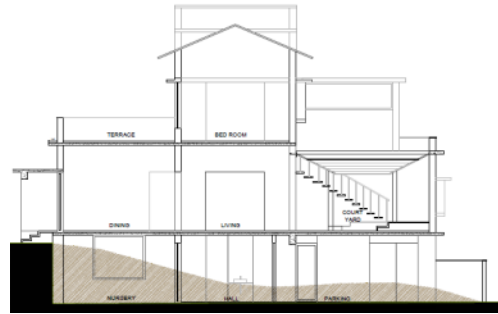
5.Bio-diversity...

# *RESOURCES*

*Avail of them closest to the site*

# ***BASEMENT***

*Space below  
the floor-  
Cannot  
support  
biodiversity....*



# Study: 6 projects

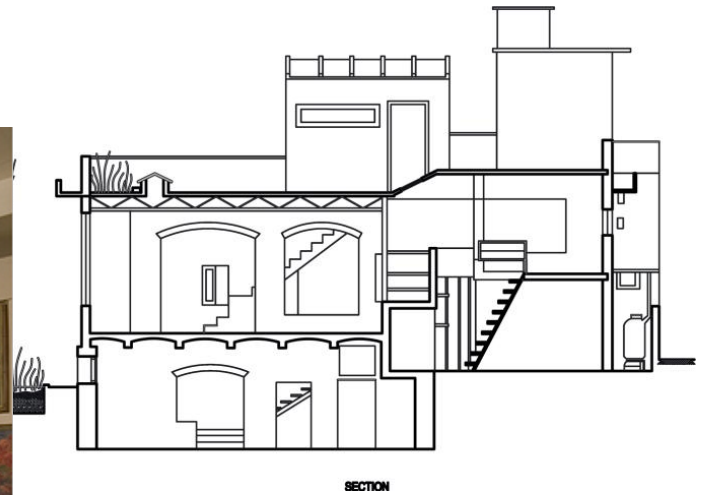
	Units	Mini and Satheesh Residence	Mukherjee Residence	Ramadurai Residence	Uma Devi, Vidyaranyaपुरa	Ghosh Residence	Sheeba and Vijay Residence
Plot Area	sq.m.	368.0	218.5	220.8	147.2	346.7	220.8
Plot coverage	sq.m.	104.9	132.5	116.0	75.2	87.8	127.7
Built Up Area	sq.m.	290.9	272.0	389.6	175.5	151.4	225.0
No. of Occupants		6.0	4.0	4.0	4.0	3.0	3.0
Roof Area	sq.m.	104.9	132.5	143.2	63.5	62.9	91.7
Basement Area	sq.m.	80.9	64.7	126.0	0.0	0.0	0.0
Soil Available	cu.m.	149.3	149.3	263.8	0.0	0.0	0.0
Soil Required for Earth blocks	cu.m.	55.2	55.6	38.8			
Embodied Energy/ Earth Walls	MJ/m3	406658.0	412794.0	290438.0	333916.0	270267.0	348791.0
Embodied Energy/ Burnt Brick	MJ/m3	1027921.0	1043430.0	734149.0	844048.0	683120.0	881649.0

*Co-operating Collaborating process of design*  
*Possibility of sharing—resource from within the city*

*CASE STUDIES*

## A. SANS SOUCI- 1995

1. Area of plot  
9.6MX16.3M
2. Basement size  
5.5MX 7M.
3. Soil available  
69.3 cu m
4. Soil used for  
building 28.36 cu  
m.



## B. MALINI RESIDENCE

1. Area of plot 9.6mX 13.3 m
2. No Basement
3. Soil used for walls 20 cu m.

**DISTANCE BETWEEN THE TWO PLOTS 1.5  
KM..**





## C.RAMADURAI RESIDENCE

2012

1.area of plot 13.0MX18.7M

2.Basement size 126sqm.

3.Soil available 263 cu m

4.Soil used for

building38.75cu m.



## D. ROHAN RESIDENCE

1. Area of plot 9.6mX 13.3 m

2. No Basement

3. Soil for walls.

**DISTANCE BETWEEN THE TWO PLOTS 8.0 KM..**



# *Inference*

- 1.Low on embodied energy
- 2.Low footprint
- 3.Low pollution
- 4.Low sand consumption

1. Buildings are changing-----higher/ newer/ deeper
2. Old materials- wasted



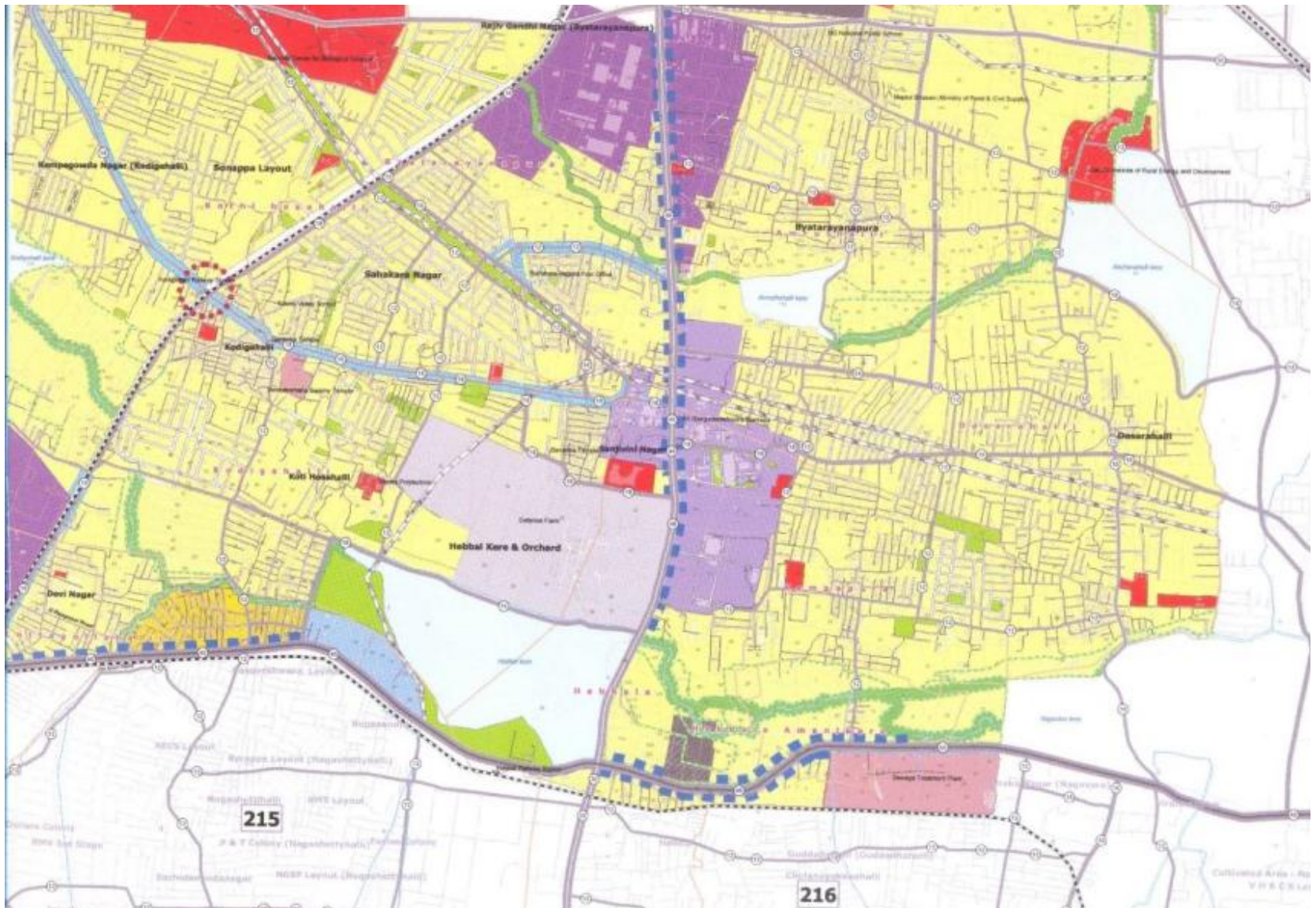
*A land fill...* Hebbal Junction Bangalore



2000



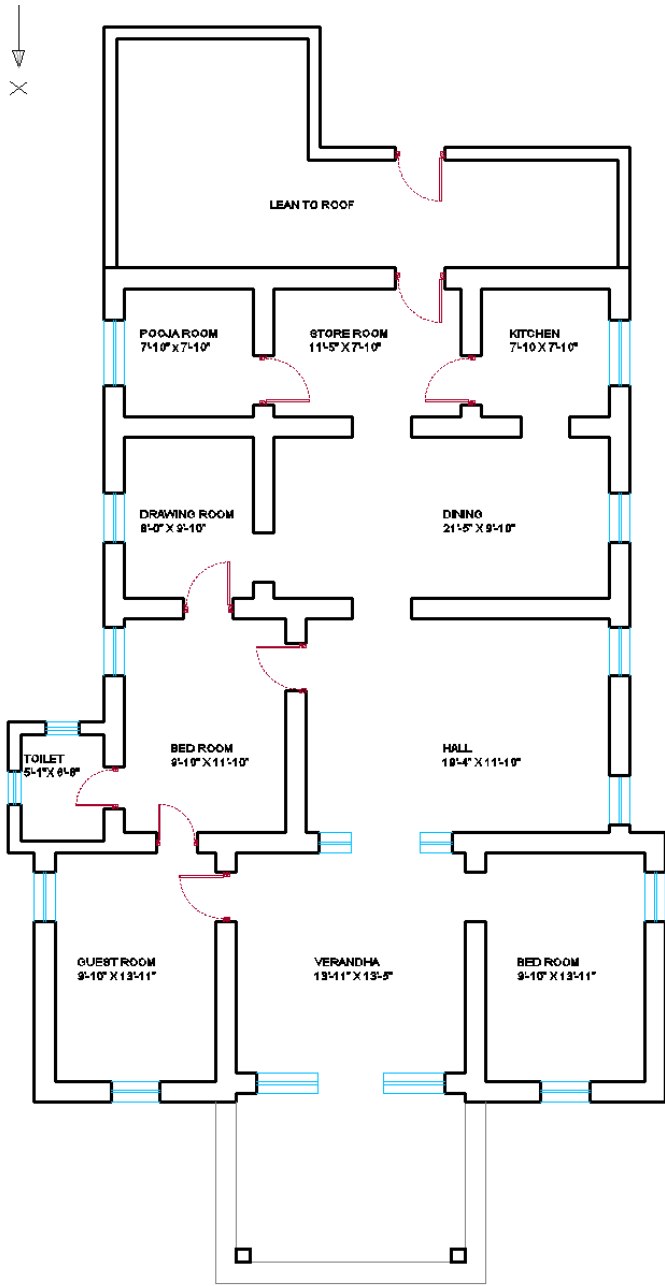
2013



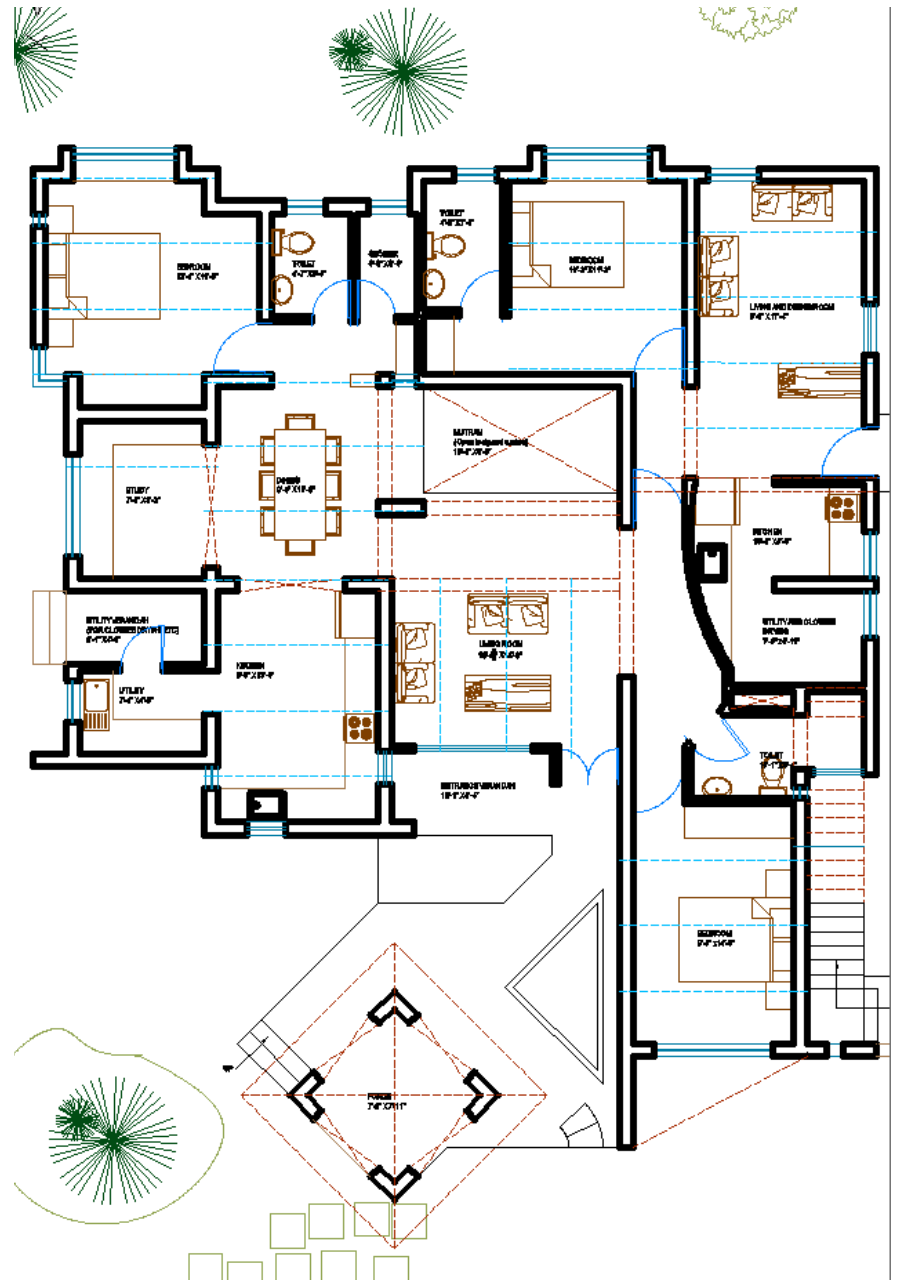
# DEVELOPMENT PLAN



*CASE STUDY: OLD FOR NEW...*  
Raghavan's residence



EXISTING PLAN

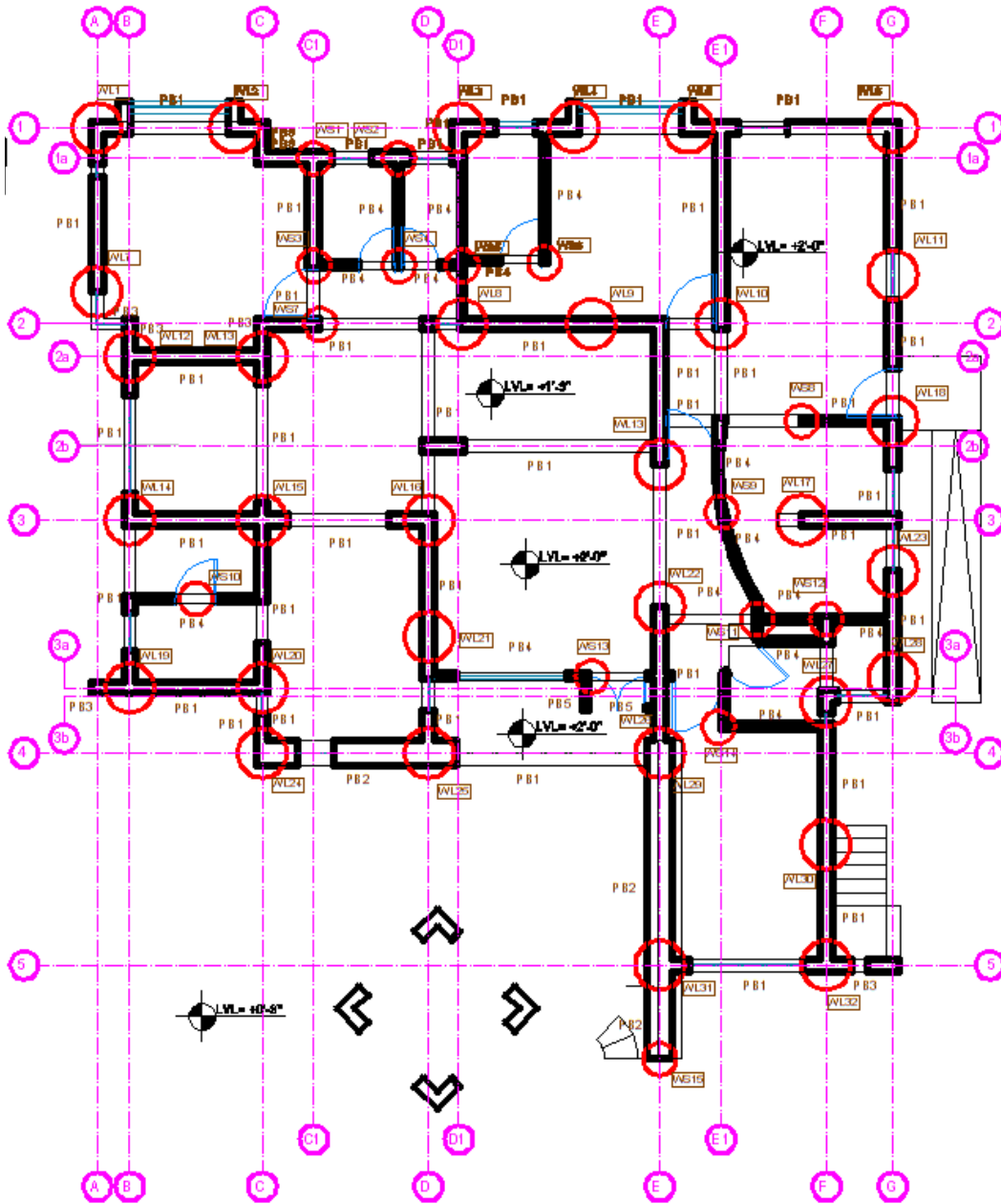


NEW PLAN



***COMPILATION OF ALL MATERIALS***





SBC TEST REPORT SHOWED  
 TILL 5M BROWN CLAYEYE SAND  
 AND EXPECTED THE  
 FOUNDATION TO START AT 3M.  
 AS EXCAVATION BEGAN AT 2M  
 DEPTH WATER WAS STUCK.







Starting a new project – damp proofing in the bottom of the rammed earth foundation.....

*Incorporating waste*

Computer key boards as  
filler material.....



*Incorporating waste*

*WATER*



***LOCALIZED WATER SYSTEMS.....HOMES***



***LOCALIZED WATER TREATMENT.....***



*A BIO-SWIMMING-POOL*



# WATER AS A RESOURCE.....

	Units	Mini and Satheesh Residence	Mukherjee Residence	Ramadurai Residence	Uma Devi, Vidyaranyapura	Ghosh Residence	Sheeba and Vijay Residence
Plot Area	sq.m.	368.0	218.5	220.8	147.2	346.7	220.8
Plot coverage	sq.m.	104.9	132.5	116.0	75.2	87.8	127.7
No. of Occupants		6.0	4.0	4.0	4.0	3.0	3.0
Roof Area	sq.m.	104.9	132.5	143.2	63.5	62.9	91.7
Fresh Water Requirement	KL/day	295.7	197.1	197.1	197.1	147.8	147.8
Rain water Harvested	KL/yr	83.9	106.0	114.6	50.8	50.3	73.4
Grey water Treatment	Ltr/day	540.0	360.0	360.0	360.0	270.0	270.0
Grey water Treatment	KL/yr	197.1	131.4	131.4	131.4	98.6	98.6
Black Water treatment	Ltr/day	240.0	160.0	160.0	160.0	120.0	120.0
Black Water treatment	KL/yr	87.6	58.4	58.4	58.4	43.8	43.8
Fresh Water From Outside	KL/yr	124.1	32.7	24.1	87.9	53.7	30.6

CARRYING CAPACITY LIMITS DETERMINED....

SMART ROOF as a generator of resources.....



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12°55'02.48"N 77°36'35.32"E

elev 2975 ft

May 17, 2007

Eye alt 10354 ft





*A SMART roof that grows rice*



How about?

A SMART roof that grows vegetables



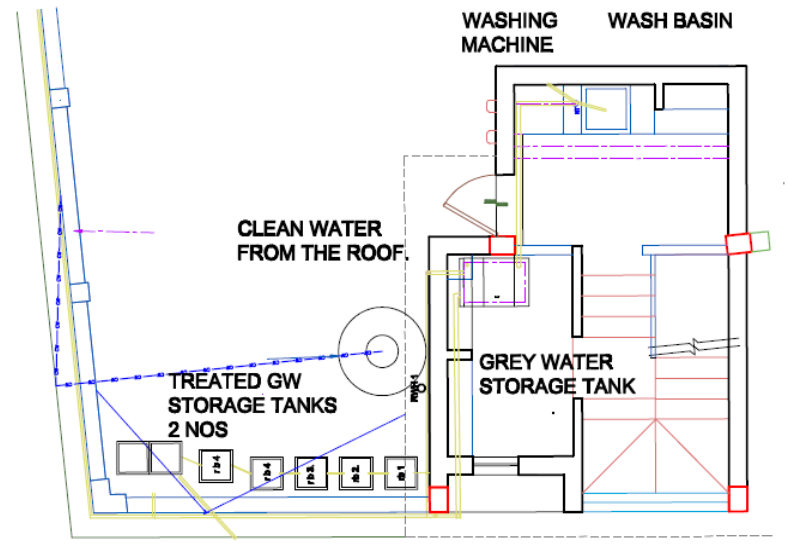
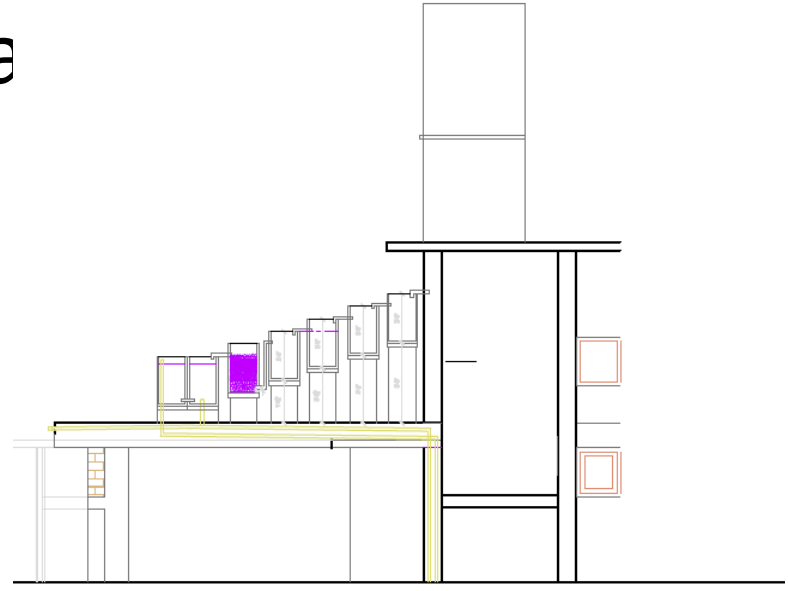
***SAFE DRINKING WATER***



tr



a



# GREY WATER TREATMENT SYSTEM





**ENERGY**

pha

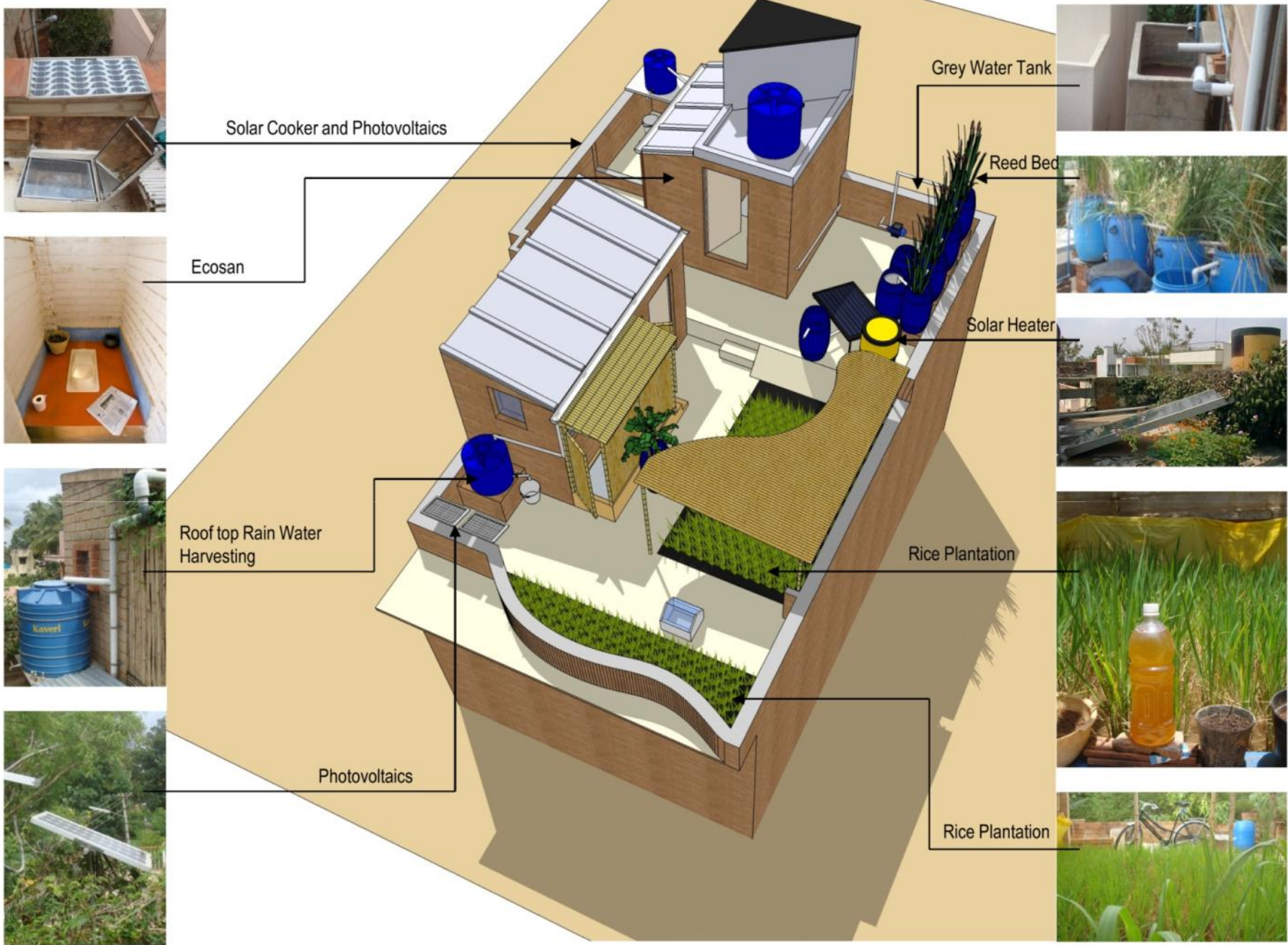




Turns sewage to a nutrient through  
Eco-san









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12°55'02.46" N 77°36'35.32" E

elev 2975 ft

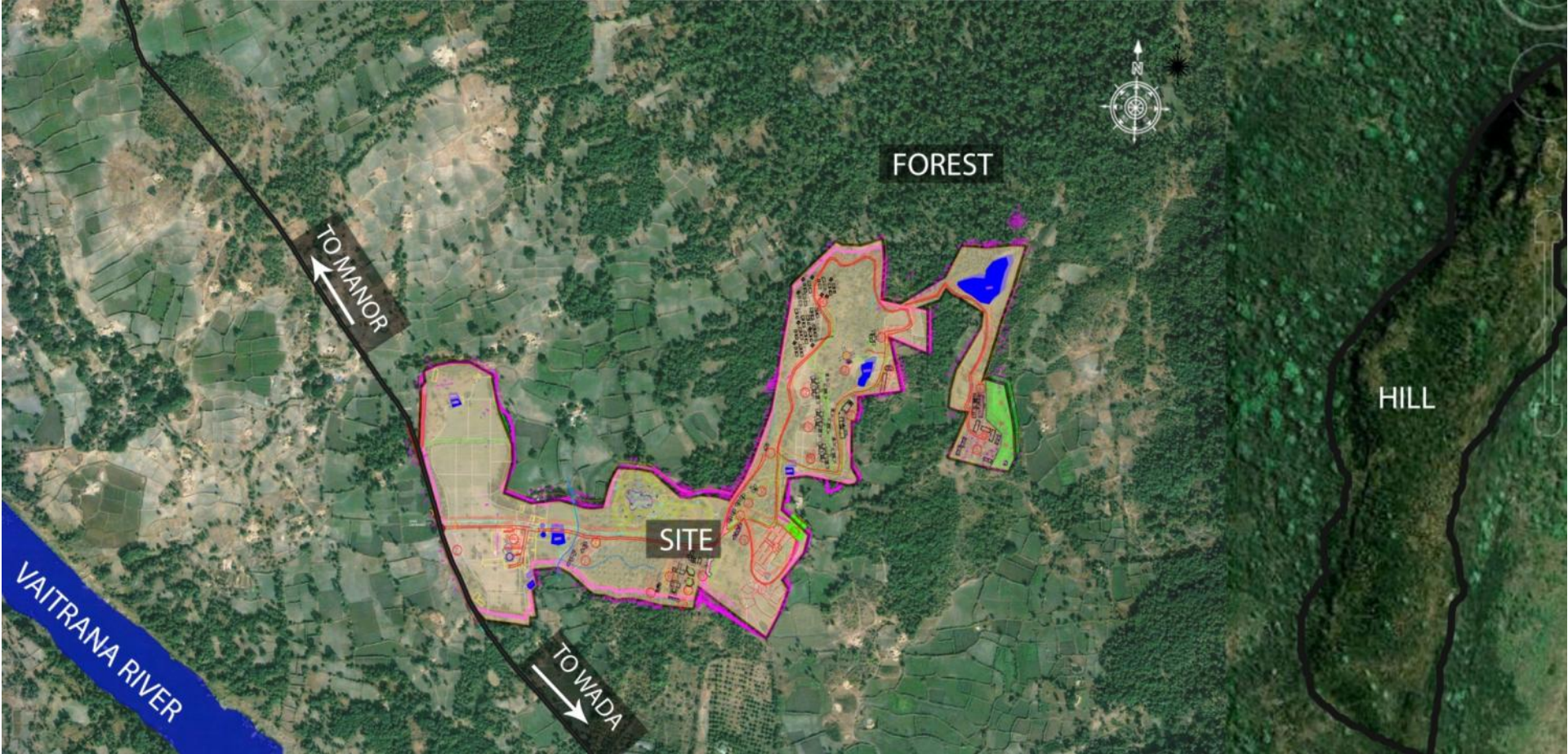
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# Site Location



# Site Location



Govardhan Eco Village (GEV ) ISKCON at Galtare, Wada situated 110 km North of Mumbai









