Design of Ecological resorts.
Case studies of Biome’s projects

IMPACTS DURING CONSTRUCTION AND OPERATION,

• ECONOMIC
• ENVIRONMENTAL
• SOCIAL
Material/ Resource/Construction Technique/Design

<table>
<thead>
<tr>
<th>Component</th>
<th>On site material</th>
<th>Local material</th>
<th>Non-Local material</th>
<th>Skill</th>
<th>Implication on site planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>Stone, Fly Ash Bricks, local bricks, rammed earth</td>
<td>Stone, Fly Ash Bricks, local burnt bricks</td>
<td>Concrete</td>
<td>available, train, innovate</td>
<td>Quaries on site to be located and use of pits to be designed, Volume???</td>
</tr>
<tr>
<td>Walls</td>
<td>Cob, Adobe, S.M.B, Stone,Fly Ash Bricks</td>
<td>Soil, Bricks</td>
<td>Concrete</td>
<td>needed, Local knowledge exists for adobe and cob</td>
<td>Quaries on site to be located and use of pits to be designed, Volume???</td>
</tr>
<tr>
<td>Lintels/Arches</td>
<td></td>
<td>Concrete, stone, S.M.B,bricks,wood</td>
<td>needed</td>
<td>None,</td>
<td></td>
</tr>
<tr>
<td>Reinforcements</td>
<td></td>
<td>Steel</td>
<td>needed</td>
<td>None,storage space</td>
<td></td>
</tr>
</tbody>
</table>
### OUR NATIVE VILLAGE,
HESSARGHATTA, BANGALORE.

<table>
<thead>
<tr>
<th>Finishes component</th>
<th>On site material</th>
<th>Local material</th>
<th>Non-local material</th>
<th>Skill</th>
<th>Implication on site planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walls</td>
<td>Mud plaster, pointing</td>
<td>Mud plaster, pointing</td>
<td>Cement plaster, Claddings etc</td>
<td>needed</td>
<td>Quarries on site to be located and use of pits to be designed Volume?? For mud finishes</td>
</tr>
<tr>
<td>Wood</td>
<td>Cashew oil</td>
<td>Cashew oil, Paints etc</td>
<td>Available, None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Floor finish       | Rammed earth floor | Terracotta tile, Stone floors, | Oxides???? Ceramic, Wood, Cement | Available, technique dependent | ????
Image courtesy: Chinch Gyrnowicz

Hessarghatta lake
BIO-POOL DURING CONSTRUCTION
COMPLETED BIO-POOL AND THE BUILDINGS AROUND

BIO-POOL AND OTHER FACILITIES
ENCOURAGING THE HANDICRAFTS

ALTERNATIVE ENERGY-SOLAR
ALTERNATIVE ENERGY-WIND

ALTERNATIVE ENERGY-SMOKELESS CHULHA, BIOMASS HEATER, AND BIO GAS
An open well, gives us both water and soil
Cob And Rammed Earth walls, using/developing using local skills
LOCAL SKILLS AND LOCAL CRAFTS—EMPLOYMENT IN THE RESORT FOR MAINTENANCE…

WITH ARCHITECTURAL INTERPRETATIONS…….
LOCAL SOILS FOR COLOURING THE EXTERNAL WALLS…

POLISHING POND BECOMES THE REFUGE FOR SMALL ANIMALS AND BIRDS…………………………………………………………………
CELEBRATING THE GRASSLANDS TO THE ADVANTAGE....

INTERIOR – LOUNGE AND FIREPLACE...
INTERIOR- DINING AREAS

INTERIOR- LOUNGE AND BAR FIRST FLOOR
COTTAGES IN THE UNDISTURBED LANDSCAPE....

INTERIORS- COTTAGE....MUD RENDERED WALLS AND MURALS...
THE SWIMMING POOL ..........

THE OPEN TO SKY TERRACE..........
THE CLUSTERS IN THE JUNGLE

OLAND ESTATE,
KULAKUMBAI, THE NILGIRIS.
DIFFERENT DESIGNS - DIFFERENT EXPERIENCES

EXISTING BUILDINGS
EXISTING BUILDINGS

EXISTING BUILDINGS
SOURCING MATERIAL FROM DEMOLITION

A ZERO DEBRIS- ZERO WASTE PROJECT
WASTE TILES- DOUBLE ROOFS
MANAGER’S BUNGALOW.............

INTERIOR - MANAGER’S BUNGALOW.. BRICK VAULT CEILINGS
GOVARDHAN ASHRAM,
GALTERE, THANE DISTRICT, MAHARASTRA.

FARMER’S COTTAGE MADE BY DEVOTEES,
TRAINING ON RAMMED EARTH
GOVARDHAN ECO VILLAGE MANIFESTO

- Minimize —
  - resource consumption
  - waste generation
  - overall ecological impact
By Five R philosophy -
- Refuse
- Reduce
- Reuse
- Recycle
- Reinvent

- Preserve existing Vegetation/or plant as per Griha
- Proper timing of Construction w.r.t. rains
- Confine Const. Activity
- Erosion and sedimentation control
- Preserve topsoil
FOUNDATION:
- PCC WITH STABILIZED MUD
- STONE MASONARY WITH STABILIZED MUD
- CONCRETE SHORT POLES (AS BOND STONE)

WALL: STABILIZED MUD BLOCKS
- MUD
- QUARRY DUST
- LIME
- CEMENT

POINTING:
- STABILIZED MUD MORTAR.

PLASTER:
- IN TOILETS- CEMENT PLASTER.
- MUD PLASTER.

DOOR & WINDOWS:
RECYCLED WOOD

ROOF:
- ARCH PANEL WITH MUD TILES.
- STEEL.
- MANGALORE TILES (BURNT CLAY TILES).
FOUNDATION: STONE MASONARY WITH STABILIZED MUD MORTAR & CONCRETE SHORT POLES (AS BOND STONE)

Walls

- Bricks EE 3(MJ/Kg)
- Concrete block EE 0.87(MJ/Kg)
- Plaster EE 1.8(MJ/Kg)
- Paint EE 67.5(MJ/Kg)
- CSEB EE 0.275(MJ/Kg)

Brick wall

Mud wall.
- Labour brought from Bangalore, training for local labour
ARCH PANEL ROOF...WHY?

- 3' 5''
  - 1/2 thick 1:2:3 M3 grade R.C.C. with reinforcement of 6mm @ 1:0” o/c. Both direction (Shrinkage reinforcement)
  - 1:3 cement mortar (see flooring detail)
  - 2” R.C.C. beam (see detail)
  - Finish flooring (see flooring detail)
  - 1” seating on the beam
  - 2” thick screed concrete 1:2:2
  - 9” x 4” x 4” (Waste) mud blocks
  - 4 mm GI Wire
ROOFS—Sloped roof

Mangalore Tile
Baton 20(w)x40(d)x2mm
Baton 40(w)x20(d)x2mm
Principal Rafter top chord

Ceiling tile
Principal Rafter bottom chord

Connector between top and bottom rafter
Shoe plate
(10mm thick plate connected to the principal rafter bottom chord)

'L' Angle 75x75x8
8mm thick stiffener plate
4 no.s 12mm Ø bolts

Base plate
(10mm thick plate embedded in concrete)

12” length anchor bolt
Concrete block
9”x9”x12”

SMB wall

BED BLOCKS CONNECTED WITH ROOF BAND
- Site selection and Planning
- Building Planning and Construction
- Building Operation and Maintenance
- Innovation