Institute of Rural Research and Development

Plot No.34, Sector 44, Institutional Area, Gurgaon, INDIA

Architect: Ashok B Lall

Radiant Cooling
(Sensible Cooling Load)

Ceiling Fans
(Air Movement)

Cool air circulation
(Fresh Air + Latent Load)
Cool Air Supply from bottom  Displacement Ventilation  Return Air from top

Controls for Radiant Cooling  Radiant Cooling Pipes

**DESIGN FEATURES**

- Use of Energy simulations while sizing HVAC Systems
- Chilled water pipes inside all floor slabs
- Supply of air at bottom and return from top
- Variable air volume system
- Heat recovery

**OPERATIONAL BENEFITS**

- Operational cost 50% lower
- Chiller operates once in two days
- Payback 1.5 years
- Equal cooling in all areas – no hot pockets
Nalanda University, Bihar

NET-ZERO
Dream or Necessity?
• Project on completion will consume
  • Water - 82.7 Crore Litres/Yr equivalent to water for 6000 People
  • Electricity - 161 Lakh Units of electricity equivalent to 21,000 People
  • Waste Generation - 8000 Kg of waste/day

• Current Situation in Bihar
  • Water - Only Ground Water Source available
  • Electricity - Bihar is energy deficient
  • Sewage Treatment - Not available
  • Waste Treatment - Goes to landfilling

• What Net-Zero can add
  • Water - No burden on location & demonstrate how it should be done
  • Electricity - No burden on state & demonstrate how it should be done
  • Waste Treatment Capacity - No burden on state & demonstrate how it should be done
NET-ZERO
Water Strategy

Water Strategy
NET-ZERO Electricity Strategy

Reduce:
- Appropriate Orientation
- Optimized windows
- Insulated envelop

Thermal Comfort
- Active Passive integrated system
- 60% lower air conditioning load

Total Site: 11.2 Mwp
- PV – 58%
- Bio Fuel – 42%
Residence at Defense Colony, New Delhi

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dbHMS Office, Noida