



geothermal india
cooling india from the ground up

geothermal india - case study





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about the project

Customer: Apollo Hospitals
(www.apollohospitals.com)

Project Details: Cancer Building
Hyderabad, AP, INDIA

Project Manager: Geothermal India

Project Design: Geothermal India

Distributor: Geothermal India
www.geothermalindia.in

Equipment: ClimateMaster Inc.
www.climatemaster.com

Key Features:

Building Size: 40,000 sqf; Ground plus 4

Project Size: 200+TR

Building Usage: Healthcare

Type of System: Water-Source Heat Pumps (WSHP)

Units: Various sizes of ClimateMaster Inc. indoor and rooftop units

Special Condition: 100% Outside Air on 4th floor for specialist treatment

Energy Savings: 43.6%

"Apollo Hospitals is delighted with the outcomes of the Geothermal India HVAC project at Hyderabad. Geothermal India has delivered on the promise for the Energy Performance Guarantee resulting in an immediate project pay-back compared to an alternative proposal. The Thermal Comfort Survey indicates almost 90% satisfaction rating."

Dr. PC Reddy, Chairman, Apollo Hospitals



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project objectives

1. Highly energy efficient HVAC
2. Financial pay-back of HVAC solution
3. Thermal Comfort & Ventilation

results

- ❖ WSHP HVAC Chiller kWh = 0.50 (space cooling component)
 - ❖ WSHP HVAC System kWh = 0.837 (cooling, fan & ventilation, pumps)
 - ❖ Tested at 24°C space cooling for floors G-3; 21°C for 4th floor
 - ❖ Actual performance of HVAC within 6% of Energy Model prediction
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- ❖ Geothermal India granted Apollo Hospitals an Energy Performance Guarantee; whereby Geothermal India would only be paid professional fees for service if our installed solution outperformed the agreed benchmark
 - ❖ Geothermal India exceeded the agreed Energy Performance Benchmark by 43.6%
 - ❖ WSHP solutions draw 80% Accelerated Depreciation Tax Benefits as per Income Tax Act of India
 - ❖ Geothermal India solution achieved an Immediate Project Pay-back compared to the costs of the benchmarked solution
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- ❖ Geothermal India's solution complies with ASHRAE Standard 170 - Ventilation of Healthcare Facilities
 - ❖ Geothermal India conducted a Thermal Comfort Survey post implementation; nearly 90% of responded were satisfied with the HVAC solution

methodology

Geothermal India utilised the following technologies:

1. eQUEST from the US DOE (Department of Energy) with proprietary add-ons for WSHP HVAC solution sizing and building simulation
2. Revit MEP for HVAC low-side design, schedules and additional building simulation
3. Life cycle cost analysis to compare WSHP to conventional chiller HVAC

Design inputs:

1. Building plans and specifications provided by Apollo Hospitals
2. Water Source Heat Pump product specifications from ClimateMaster Inc
3. Heat load factors - people, equipment provided by Apollo Hospitals
4. Indicative hours usage per annum provided by Apollo Hospitals
5. Hyderabad weather conditions from ISHRAE weather file
6. Conventional HVAC system energy efficiency and cost data for comparison



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about geothermal india

geothermal india™ is the first company to successfully design and implement open loop geothermal air-conditioning solutions in India. geothermal india™ is the first company in India to offer Energy Performance Guarantees on all projects; standing by the energy efficiency we promise our customers.

geothermal india's™ geothermal execution experience offers India air-conditioning with the lowest lifecycle cost. Lowest lifecycle cost is the sum of acquisition & installation costs of air-conditioning together with its operation & maintenance costs.



about apollo hospitals

The Apollo Hospitals group includes over 8500 beds across 53 hospitals in India and overseas, neighbourhood diagnostic clinics, an extensive chain of Apollo Pharmacies, medical BPO and health insurance services and clinical research divisions that are working on the cutting edge of medical science.

Apollo Hospitals is Asia's largest, private healthcare group.



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