Indo-Swiss Building Energy Efficiency Project

Case Study: Jupiter Hospital, Pune

Ministry of Power
Government of India

Energy is Life
BEE
Conserve It

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

OVERVIEW

The Indo-Swiss Building Energy Efficiency Project (BEEP) provides technical assistance to builders and developers in designing energy efficient buildings. The technical assistance is provided by conducting a design charrette in the early design phase of the project.

Jupiter Hospital, Pune is a 350 bed multi-speciality hospital; the second project under Jupiter Lifeline Hospitals Ltd. It was the 8th project selected for the BEEP Integrated Design Charrette and the charrette was held in February 2014. The project was completed in December 2016.

PROJECT DETAILS:

- Built-up area: 26580 m^2 (excluding parking and service floor: ~9500 m^2)
- Number of floors: 3 underground floors, 9 overground floors + 1 service floor
- Types of spaces: Technical areas like MRI, ICUs, Cath lab, OTs; patient indoor rooms and recovery rooms; restaurants, emergency rooms, etc.

	BEFORE CHARRETTE	AFTER CHARRETTE (As built)
EPI (excluding Parking and service area)	154 kWh/m^2.year	130 kWh/m^2.year
16% ENERGY SAVINGS		
ANNUAL ELECTRICITY SAVINGS ~ 637920 kWh		

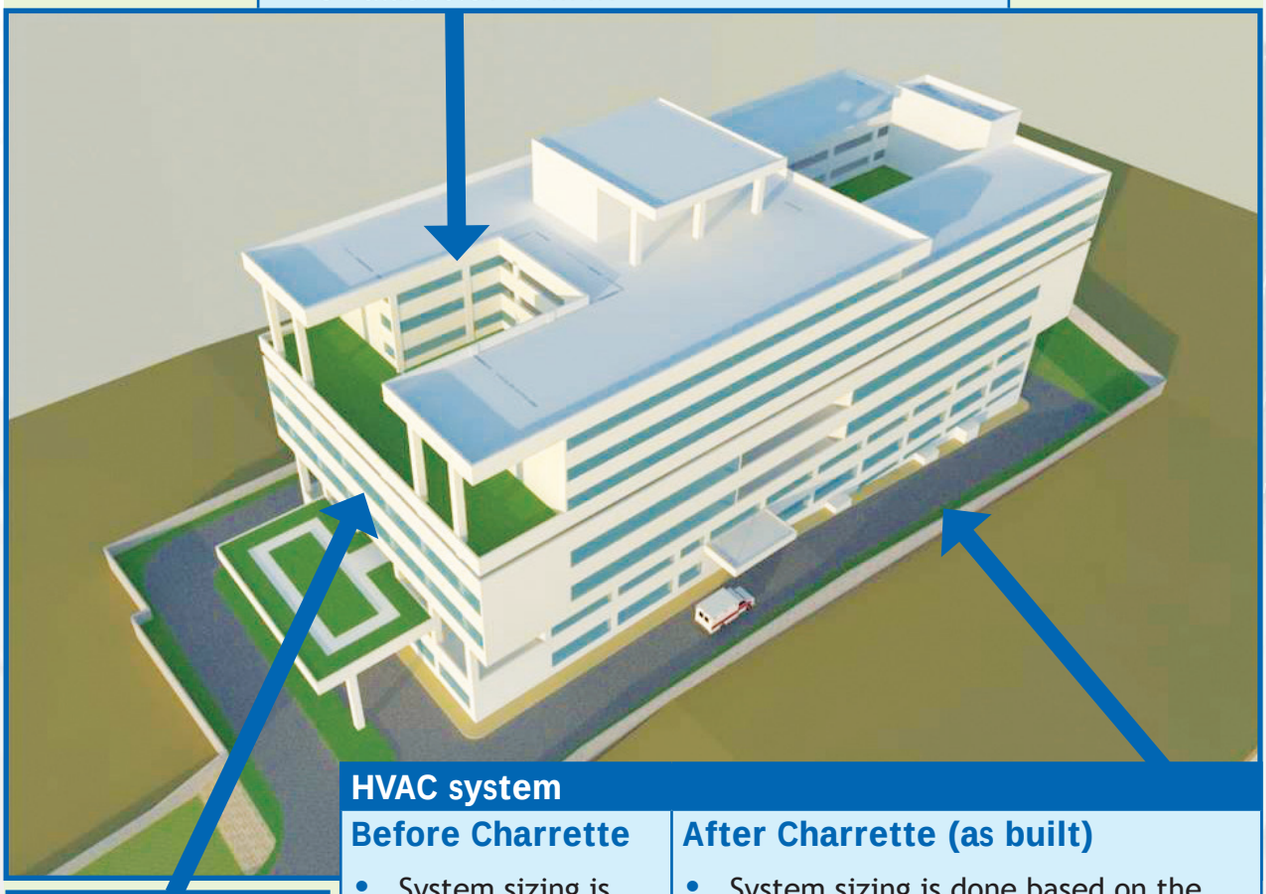
Roof Assembly

Before Charrette

- 150 mm RCC construction
- U-value: 1.76 W/m^2.K

After Charrette (as built)

- 150 mm RCC construction
- 100 mm extruded polystyrene (XPS) insulation
- U-value: 0.31 W/m^2.K



Wall assembly

Before Charrette

- 230 mm brick wall
- U-value: 2 W/m^2.K

After Charrette (as built)

- 150 mm AAC blocks
- U-value: 0.9 W/m^2.K

HVAC system

Before Charrette

- System sizing is done based on the static design conditions
- Air conditioning design ~ 430 sq.ft/TR
- COP - 5.75
- Heat recovery: 50% (Sensible)
- AHUs with reheat systems

After Charrette (as built)

- System sizing is done based on the dynamics design conditions simulation
- Air conditioning design ~ 514 sq.ft/TR (Reduction in system size ~ 16.5%)
- Heat recovery: 75% (Sensible + Latent)
- Gliding chilled water temperature at part loads
- Using condenser water for reheating in AHUs with a back up from hot water system
- Free cooling done for patient floors

Indo-Swiss Building Energy Efficiency Project (BEEP)

The Indo-Swiss Building Energy Efficiency Project (BEEP) is a bilateral cooperation project between the Ministry of Power (MoP), Government of India and the Federal Department of Foreign Affairs (FDFA) of the Swiss Confederation. The Bureau of Energy Efficiency (BEE) is the implementing agency on behalf of the MoP while the Swiss Agency for Development and Cooperation (SDC) is the agency in charge on behalf of the FDFA.

The overall objective of the project is to reduce energy consumption in new commercial buildings and to disseminate best practices for the construction of low energy residential and public buildings.

The project contributes to strengthening and broadening the Bureau of Energy Efficiency's (BEE) building energy conservation programme. It has the following components:

- **Component 1:** Design workshops (charrettes) with public / private builders
- **Component 2:** Technical assistance in developing building material testing infrastructure
- **Component 3:** Developing design guidelines and tools for the design of energy-efficient residential buildings
- **Component 4:** Production and dissemination of knowledge products

Builders, developers and other interested agencies can apply for charrettes on: http://www.beepindia.org/content/apply-integrated-design-charrette

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