



Bihar Museum

Location	: Jawaharlal Nehru Marg, Patna, Bihar
Site Area	: 54,000 m ²
Built-up-Area	: 23,600 m ²
Typology	: Commercial building
Energy Consumption Reduction	: 53% reduction in energy consumption compared to GRIHA benchmark
EPI	: 66.18 kWh/m ² /year
GRIHA provisional rating	: 5 Star Rating (Version 3.1)
Year of completion	: 2018

The following strategies were adopted to reduce the building impact on the natural environment:

📍 Sustainable Site Planning:

- Out of 423 existing mature trees, 165 mature trees were preserved and in addition compensatory plantation of 774 trees was done on site.
- Site was screened with 3m high barricading; wheel washing facility was provided for vehicles entering the site and water was sprinkled on site to control dust pollution.
- 1,680m³ top soil was preserved within the site and reused for landscaping.

📍 Water Management:

- Reduction of 60.5% from the GRIHA base case has been demonstrated in building water demand by installing water efficient fixtures.
- Reduction of 62.5 % from the GRIHA base case has been demonstrated in the landscape water demand.
- Gunny bags/hessian cloth were used for curing of columns and ponding technique was used for curing of slabs.

📍 Energy Optimization & Occupant Comfort:

- For achieving visual comfort:
 - » More than 25% of the total living area is day-lit and meets the daylight factor as prescribed by NBC 2005.
 - » 100% of the outdoor lights have been connected with automatic switches.
- For achieving thermal comfort:
 - » EPI reduction of 52.13% from the GRIHA base case has been demonstrated through the integration of high-performance systems.
 - » Water cooled scroll chiller with COP of 6.16 have been installed which complies with ECBC.

📍 Renewable Energy Technology installed on Site:

- Solar Photovoltaic system of capacity 10kWp and proposed capacity is 220kWp is installed on-site in the project for complying with the mandatory clause.

📍 Sustainable Building Materials:

- Flyash bricks with 60% fly ash content by volume have been used in the project.
- Kota stone, sandstone, rubber tile, carpet and vitrified tiles were used as a flooring material in the building.

Integrated Design Team:

Client	: Bihar Construction Department
Principal Architect	: Opolis Architects + Maki and Associates
Landscape Architect	: Forethought Consultants
Structural Consultant	: Mahendra Raj Consultants
MEP Consultant	: Design Bureau
Green Building Design and Certification	: Environmental Design Solutions