BEL Academy for Excellence

Location	:	Bengaluru
Site Area	:	23,239.5 m^2
Built up Area	:	7,671 m^2
Air-conditioned Area	:	4,856 m^2
Non Air-conditioned Area	:	2,815 m^2
Typology	:	Training Center
Energy consumption reduction	:	66.73% reduction in energy consumption compared to GRIHA benchmark
Energy Performance Index (EPI)	:	43.40 kWh/m^2/year
Renewable Energy	:	Rated capacity of solar PV installed on site is 90KW
GRIHA provisional rating	:	5 Stars
Year of Completion	:	2017

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

Sustainable Site Planning:

- Out of 110 existing mature trees which were located within the site boundary, only 45 trees were cut and 65 trees were transplanted. Furthermore, 260 new saplings were planted on the project site.
- Air pollution control measures such as site barricading, coverage of dusty material and other appropriate measures were strictly adhered to during construction.
- Consolidated utility corridor has been constructed on site to reduce site disturbances and ensure scalability for future expansion ensuring maintenance on site simple and easy.

Water management:

- 73% of building water demand has been reduced against the GRIHA baseline by using measures such as installation of low flow water fixtures and dual flushing system.
- 46% savings was achieved in landscape water requirement as against the GRIHA baseline by adopting native species of vegetation.
- The rainwater harvesting tank constructed on site has the capacity to hold complete rainfall received in a year.

Energy Optimization:

- For achieving visual comfort:
  - » Facades with WWR 18.6% were built with a good visual connection between the occupants and the outside environment.
  - » 55.6% of the habitable spaces in the building are day lit and meet the daylight factors as prescribed by the National Building Code of India.
- For achieving thermal comfort:
  - » Project has been designed with passive design measures and thermal insulating envelope comprising fly-ash bricks and double glazing units.
  - » All regularly occupied spaces are conditioned with high efficient VRF systems of 3.70 COP to maintain comfort condition.
  - » The energy efficient measures incorporated in the project helped the project achieve 64.27% reduction in EPI from the GRIHA benchmark EPI.

Renewable energy technologies integration:

- The project has installed 90 kWp capacity of solar PV panel. The energy generated by these solar PV meets the energy requirement of more than 100% of the installed lighting load.
- The capacity of installed solar panels is capable to handle 16.80% of lighting and HVAC load.

Sustainable building materials:

- The embodied energy of the structural system is reduced up to 5.31% by deploying post tensioned beams against the conventional RCC beams.
- Sustainable materials such as gypsum plaster boards and calcium silicate tiles for false ceiling, gypsum board partitions and FSC certified wall paneling, MDF boards for in-built furniture and composite based wooden material for the internal doors have been used in the project.
- 28% of cement is replaced with fly-ash by weight in structural concrete and plaster and masonry mortar and 60% of cement is replaced with fly-ash by volume in building blocks to reduce embodied energy of the project.
- 100% of all paints and adhesives used in the building interiors have low or zero-VOC.

Integrated Design Team:

Client	: M/s Bharat Electronics Ltd.
Project Coordinator	: BEL - Project Management Group-2/ES
Principal Architect	: Sr. DGM (CNP/ES) - BEL
Landscape Architect	: M/s Green Valley Landscapes
Project Management Consultant	: BEL - Project Management Group-2/ES
Structural Consultant	: BEL - Construction New Projects/ES
Electrical Consultant	: BEL - Construction New Projects/ES
Green Building Design and Certification	: M/s Conserve Consultants Pvt. Ltd.