

Nanoscience Centre of Excellence

Sri Lanka / Homagama

6.8262435, 80.038239

Client Name: Sri Lanka Institute of Nanotechnology - SLINTEC

Project website: www.slintec.lk

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Project Description

The SLINTEC, Nanotechnology park is one of the pioneering visions of the greater 'knowledge hub' development plan for Homagama creating a unique opportunity to house research incubation and technology commercialization in one setup that functions to both the public and private sectors. The building is a catalyst for scientific research putting Sri Lanka on the map for science and technology with the state of the art facility being the signature trademark for the nanotechnology park that is to proceed in the future master-plan.

Building Details

Type of Building

Institutional

Type of project

New building project

Site Area

205000 m²

Number of Floors

5

Gross floor area

12500 m²

Net floor area

11200 m²

Non Air-conditioned area

3500 m²

Performance Standards

LEED (USGBC) Platinum

Total Cost

EURO 91500

Cost per m²

EURO 480

Year of completion

2013

Year of occupancy

2013

Project Team

Organisation

Arch International Pvt Ltd

Website

<http://archinternational.net/>

General contractor

Tudawe Brothers

Structural Engineer

Arch International Pvt Ltd

Architech

Arch International Pvt Ltd

Energy Modeller

Environ Sustainability Globe Pvt Ltd

Lighting design

Arch International Pvt Ltd

Environmental Consultant

Environ Sustainability Globe Pvt Ltd

MEP consultants

Arch International Pvt Ltd

Climate Analysis

Describe the local climate

Homagama as is Colombo, has tropical monsoon climate and has sunny days throughout the year. The city temperatures varies between 24-31 C throughout the year. During the monsoon season, Homagama gets heavy rainfalls. Usually April to May and September to November records highest rainfall figures.

Design Approach

Concept

The SLINTEC, Nanotechnology park is one of the pioneering visions of the greater 'knowledge hub' development plan for Homagama creating a unique opportunity to house research incubation and technology commercialization in one setup that functions to both the public and private sectors. The building is a catalyst for scientific research putting Sri Lanka on the map for science and technology with the state of the art facility being the signature trademark for the nanotechnology park that is to proceed in the future master plan.

Site integration

The Nano-science center of excellence is located on a high ground with an elevation overlooking the surroundings of the planned nanotechnology park. It is a catalyst building which is to sprung open the new investments and research tenants for the nano park. The building is of the 1st phase of 3 phase development. The Surrounding developments in the close vicinity is predominately technological and educational institutions and is apart of the "Knowledge hub" - Homagama, vision.

Building design

The hexagonal plan profile encloses a quadrangular atrium that is covered by a pyramidal skylight & opens up a triangular courtyard that generates a skeletal curved three member tower converging to a singular point pinnacle spire depicting the play of polygons and shapes inspired by Carbon's molecular structures that is observed at nanoscopic levels. The center is composed of five levels. The ground floor comprises of public areas and the financing and incubation areas. A Basement houses a one of a kind vibration-proof underground laboratory for housing ultra-sensitive electronic microscopes. Offices for scientists and management is located on the first floor while the second floor takes you through laboratory facilities and further areas for research. Finally a roof terrace level acts as the podium for services and a solar array topped with the 3 pronged iconic tower. The large Atrium dominates the design being a source of light and ventilation that acts as a link both physically and visually to all levels of the building. Strategies such as lush green landscaping, courtyards, creation of natural ventilation through drafts and stack effect, use of evaporative cooling, shading devices, Rainwater harvesting, Green rated fixtures, Alternative Energy source of a 102 kW Solar Array were all initially designed around as key principal requirements to achieve the highest sustainability.

Special Feature

Natural Lighting

80% of the functioning hours are using daylight since the building optimizes use of natural light. The second skin provides shading.

Water efficiency

The water utilised for evaporative cooling is collected at the central courtyard from the run-off from the roof of the building. The rest is re-directed to the extensive external garden.

Passive heating/cooling

Given the sensitive nature of the function, a major portion of the usable areas are Air-conditioned. The use of indoor pools and open courtyards contribute to evaporative cooling methods whilst an open plan allows for cross ventilation thus ensuring the coolest possible indoor temperatures. The shading device is in the form of an external skin that minimizes heat gain while not compromising on the amount of daylight that penetrates the interiors. The open to sky courtyards incorporates the draft and stack effect thus creating natural ventilation and pushing warm air out from the top. Solar panels on the roof level ensure the highest achievable sustainability throughout the building.

Eco-friendly features

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Other features

The external skin of the building is a modular shading device to minimize solar exposure and gain, thereby reducing the energy demand of the internal air-conditions that is compulsory for the scientific instrumentation. Climatic models suggest a drop of 1 to 2 degrees in temperature with the skin and thermal coating for exposed glass.

Energy systems

Interior Lighting

All light fitting are LED or fluorescent.

Exterior Lighting

LED Sensor controlled

Ceiling Fans

n/a

Air-conditioning

VRV Air Conditioning System with zone climate control and user detection units.

Lift

yes

Energy efficient systems

2 Nos of 50 kW systems with Net metering facility. Rough Power generation 11,000 units per month which is approximately 30% of the building consumption
