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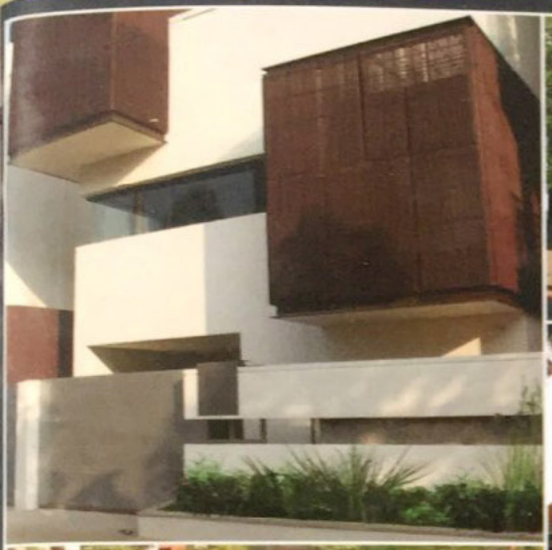

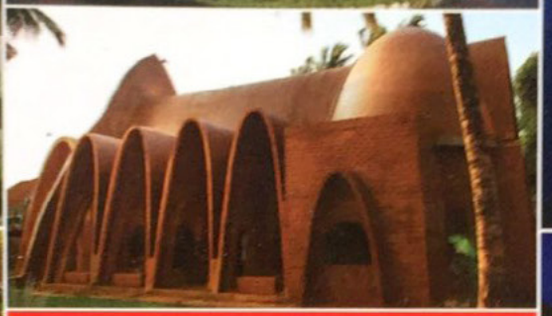

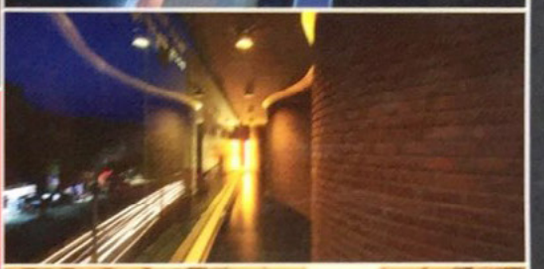

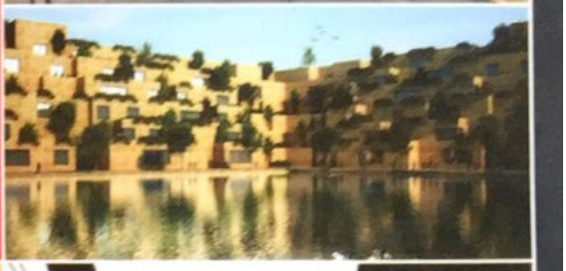

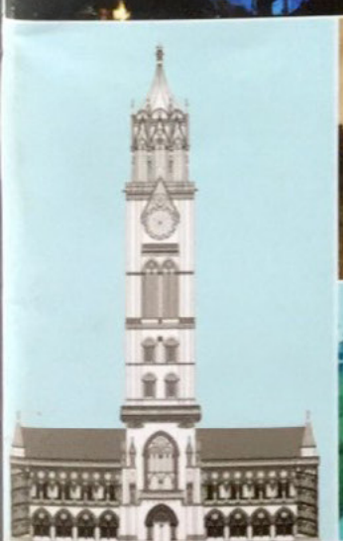

New Administrative Building for Pimpri Chinchwad New Town Development, Pune

Ar. Usha Rangarajan
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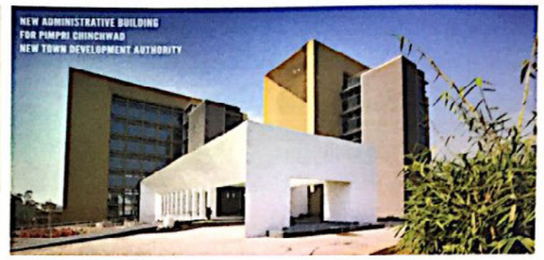
Ar. Usha Rangarajan, is the Principal of Landmark Design Group which she established in 1993. It has grown since then to build a team of 25 Architects, Interior designers, Engineers, 3D visualizer and support staff. She is an Evaluator for green buildings under GRIHA and was Awarded Entrepreneur of the year in service sector 2015 by Entrepreneurs International.



BACKGROUND

PCNTDA is a visionary organization.

PCNTDA plays the role of a catalyst, a change agent.

.... a creator of a better living environment for the urban populace.

WHY A GREEN BUILDING FOR PCNTDA ?

The Pimpri-Chinchwad New Town Development Authority has played the role of a Visionary and a guiding light - in creating a successful model of a sustainable township, be it the well- planned infrastructure such as roads, water supply, electricity, recreational zones, transportation network .

it was thus a unanimous decision of all the stake holders that the 'the new Administrative building' for PCNTDA should be a fore-runner, an ICONIC BUILDING that would set an example for others to emulate.

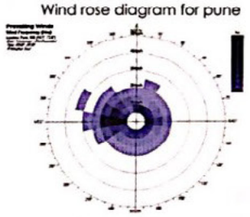
GOALS

MAXIMIZE DAYLIGHT, NATURAL VENTILATION
PASSIVE DESIGN, FOR THERMAL COMFORT
FUNCTIONALLY EFFECTIVE
REDUCED ENERGY USE

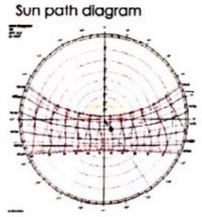
CLIMATE RESPONSIVE DESIGN

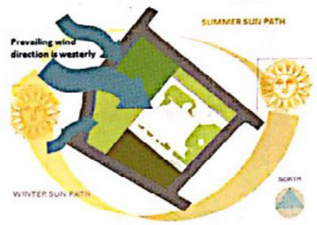
Pune's climate is moderate when compared to much of India (though ECBC classifies it under WARM AND HUMID)
Wind (mostly cool; even in summer) is available almost throughout the year. From the onset of monsoon, the months of June, July, August and September are actually very comfortable.Our summers are Relatively shorter, and not so unbearable!

Wind rose diagram for pune



Sun path diagram





Building needs to be protected from west& east sun majorly since the angles are very low. Where as Radiation from south can be taken care of by means of appropriate shading devices.

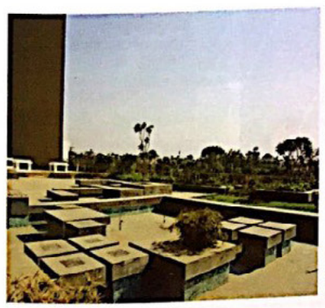
SITE FEATURES

CUT AND FILL HAS BEEN MINIMIZED to a great extent due to this,
1. All drainage and storm water flows have been planned to be gravity-based.

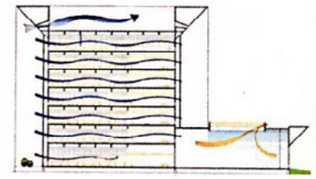
Thus
the STP IS LOCATED AT THE LOWEST CONTOUR.

2. Slope is used to create a STILT PARKING AREA accessed from the lower side, while the main edestrian entry remains at ground level from the higher side

1. SEPARATE UTILITY CORRIDOR IS ASSIGNED FOR ALL SERVICES
2. VEHICULAR AND PEDESTRAIN MOVEMENT IS SEGREGATED
3. VEHICULAR MOVEMENT IS UNI DIRECTIONAL PEDESTRAIN MOVEMENT IS MINIMUM AS THE MAIN ENTRY IS CLOSE TO ENTRANCE PORCH AND SEPARATE PATHWAY IS ALLOCATED



Landscape around building



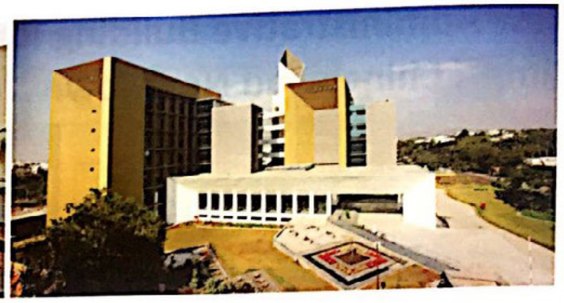
SECTION THORUGH BUILDING

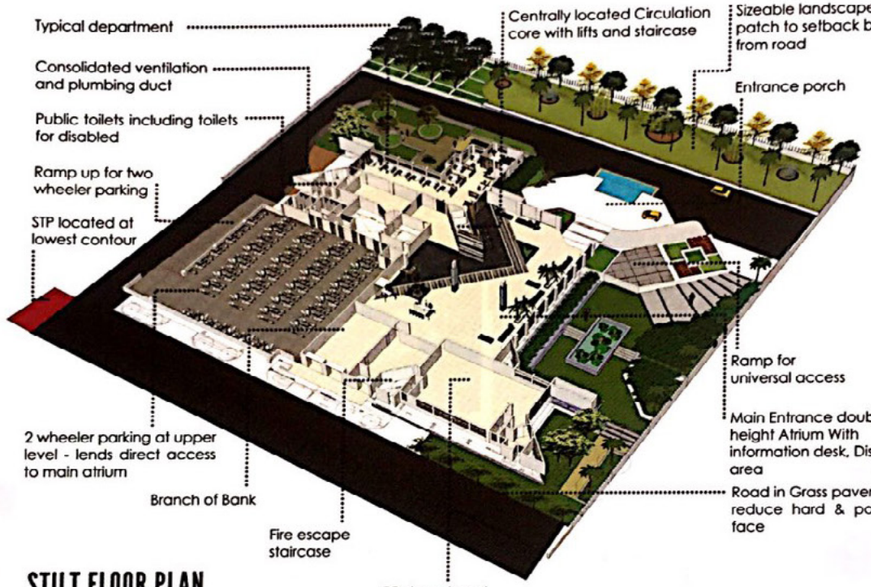
Evaporative cooling by westerly winds passing over mist fountains

The design has been conceptualized to achieve :

Minimum disturbance to natural topography.
Maximizing access to views, day light and ventilation.
Ensuring proper orientation of majority of the building's wings w.r.t sun and wind, to ensure proper daylight, natural ventilation and reduced heat gain.
Ease of access for emergency services.

ENTRANCE AREA LANDSCAPE

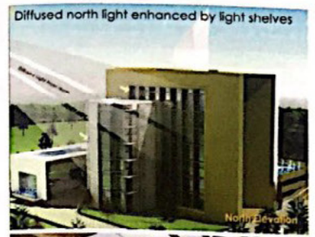


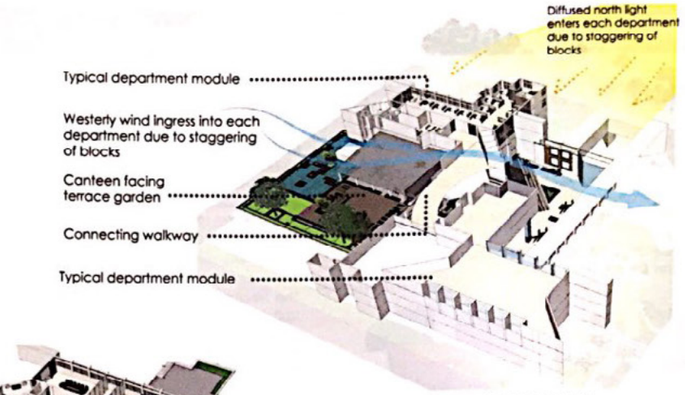


STILT FLOOR PLAN

TYPICAL DEPARTMENT MODULE

Project Details	
Project Category	: Institutional Projects
Project Name	: New Administrative Building for Pimpri Chinchwad New Town Development
Completion Date	: November 30, 2012
Location	: Akurdi, Pune
Plot Size	: 14520.30 Sq.M.
Area	: 82357.30 Sq.Ft.

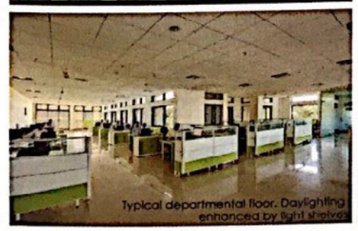


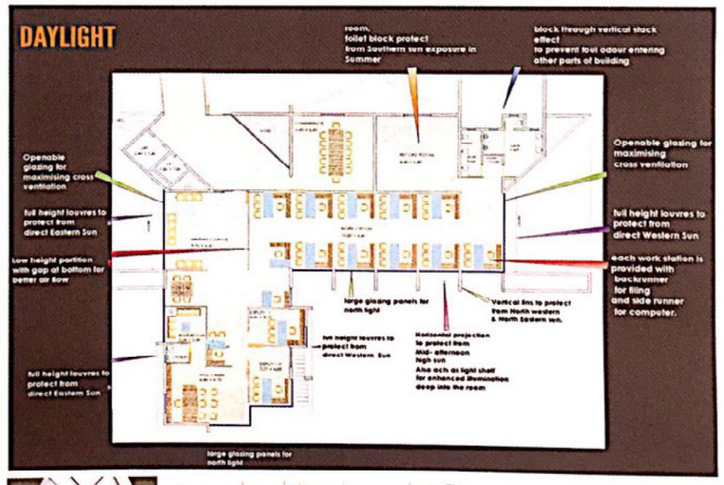


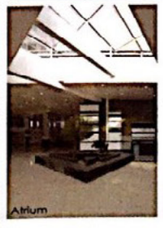
FIRST FLOOR PLAN

NARROW FLOOR PLATE of working spaces is used .The south east and north west openings are large, to ensure MAXIMUM CROSS VENTILATION, & protected by HORIZONTAL LOUVERS, TO PREVENT DIRECT RADIATION from entering the building form these directions.

SIXTH FLOOR PLAN







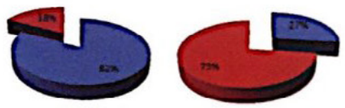
Average daylight factor: 4.05
concept of light shelf used for enhancing daylight
all work floors are well lit thus reducing the demand for artificial lighting in daytime

WATER EFFICIENCY-RENEWABLE ENERGY-WASTE MANAGEMENT-AWARENESS

WATER USE IN LANDSCAPE

MAINTENANCE From the pie diagram given below 73% of the area is low maintenance area for landscape. Maintenance includes :
1.Less Water requirements for Plants
2.Drippers are used as water saving measures

Percentage Annual Reduction in Landscape Water Demand – 56.34 %



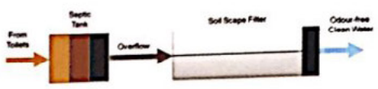
As the pie diagram is showing only 18% of the species are exotic and the rest are native.

■ high maintenance ar
■ low mainenance are

SEWAGE TREATMENT PLANT

MAINTENANCE From the pie diagram given below 73% of the area is low maintenance area for landscape. Maintenance includes :
1.Less Water requirements for Plants
2.Drippers are used as water saving measures

The treatment will include the following unit / equipment;
- Septic tank
- Soil scape filter
- Treated water storage tank

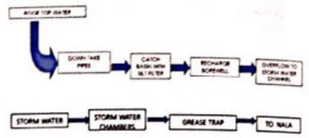


WATER RECHARGE & MANAGEMENT

Taking into considerations the Hydro geological report, there exists both SHALLOW AND DEEP AQUIFER conditions on site.
The recharge capacity of the available aquifer is 25.95 lakh litres whereas The overall storm water generated on site is 142.408 lakh litres. Hence the entire water cannot be recharged into the ground.

THE RAIN WATER FROM THE ROOF TOP & TERRACES IS SEGREGATED FROM THE RAIN WATER FROM OPEN AREAS, HARD COURTS & PARKING AREA

STORM WATER MANAGEMENT



RENEWABLE ENERGY UTILIZATION

DESIGN CALCULATION FOR RENEWABLE ENERGY SYSTEM

Solar PV 100KW peak system work sheet		
Power generation per Day average		
the rate of 5 units per 1 kw peak	500	Kwh
System efficiency 95%	475	
Units for consumption	475	per day
Spare units of non working day will be30%		
with storage capacity will be 5 % per day	500	Kwh

Tender Cost of 100 kWp SPV system: Rs.1.87 cr
Subsidy from MNRE : Rs.0.60 cr
Net cost : Rs.1.27 cr

100kwp solar PV system: It is a uniquely designed solar PV generation system integrated with buildings electrical needs
- It is a 100kwp solar PV generation system, expected to generate 475 Kwh per day.
- This is grid assisted system which will work as follows

NET SAVINGS IN CAP EX-65 LAKHS
EFFECTIVE COST-62 LAKHS

Annual savings in energy bills: 15 lakhs
Annual savings in avoiding transformer losses @3 % & avoiding ups losses @14 %: : 16 lakhs

Accelerated depreciation @ 80% in very first year

The building will be majorly non-dependent on the grid: the energy produced is clean, efficiently used and the very short payback period achieved can surely be a motivation for other similar projects

All the lighting and equipment load is connected to renewable energy. in case of peak demand, the system is designed to be hybrid and it switches over to grid supply. Simulations were carried out for the period of an entire year to determine suitable shadow free (buildings & trees) location of solar panels.

REDUCTION IN WASTE DURING CONSTRUCTION

Stock piled sand sprayed with water frequently to prevent dispersal by wind

Empty paper boxes of tiles , modular false ceiling tiles, Electrical fittings, Plumbing & sanitary ware sent to re-cycling.

Empty exterior Paint buckets stored in parking area & sent to recycling.

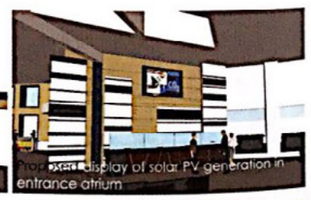
Sizeable amount of waste is reduced during construction by proper planning.

Recycling of construction waste was carried out diligently.

USE OF FLY ASH IN NON- STRUCTURAL APPLICATIONS HAS HELPED TO REDUCE EMBODIED ENERGY AS WELL AS WEIGHT AND VOLUME OF THE BUILDING

USE OF NON TOXIC, LOW VOC, NON TIMBER IN INTERIORS

Proposed interactive touch screen panel for sharing 'green knowledge'



Proposed display of solar PV generation in entrance atrium

Proposed space for exhibitors of 'green products and technology'

What we have learnt from this project is that ; for the making of a Green Building, a Holistic, Integrated and Balanced approach towards Design, Construction, Operations and Life cycle is the right path to attain true 'Sustainability'.