



MAHARSHI KARVE STREE SHIKSHAN SAMSTHA'S
DR. BHANUBEN NANAVATI
COLLEGE OF ARCHITECTURE
FOR WOMEN

DEPARTMENT OF ENVIRONMENTAL ARCHITECTURE



Master's in Environmental Architecture

- Two years full time course
- First to start in the India
- Council of Architecture(COA), india
- Affiliated to Savitribai Phule Pune University (SPPU)
- Recognised by Indian Green Building Council (IGBC)

ENVIRONMENTAL ARCHITECTURE- THRUST AREAS



Climate Responsive Design
& Simulation Analysis

Energy Efficiency Services
and Management

Environmental
Management

Climate Change &
Resilience Planning

Natural Resource
Management



Faculty



Dr. Sujata
Karve
HOD - EA



Dr. Prajakta
Dalal-
Kulkarni
Associate
Professor



Ar. Sonali
Rajwade
Associate
Professor



Ar. Namrata
Dhamankar
Assistant
Professor



Ar. Rahul
Nawle
Associate
Professor



Dr. Nikhil
Shejwalkar
Visiting
Faculty



Adv.
Gauri
Joshi
Visiting
Faculty



Ketaki
Ghatge,
Visiting
Faculty



Er. Amar
Chakardeo
Visiting
Faculty

Guests and Experts

- Prof. G.K. Kanhere
- Ar Rajiv Raje
- Ar. Shirish Kembhavi
- Mr. Rohit Bhagwat
- Ar. Vivek Dixit
- Ar. Mili Mujumdar
- Ar. Priyanka Kocchar
- Priyadarshini Karve
- Tejaswini Chitale
- Ar. Rahul Kadam
- Er. Sachin Deshpande
- Ar. Sanjay Mohe
- Mr. Vivek Gilani
- Mr. Rumi Engineer
- Mr. Aalok Deshmukh
- Ar. Sangita Kapoor
- Ar. Mahesh Harhare
- Dr. Rajat Gupta
- Ar. Prasad Vaidya
- Mr. Satish Kumar
- Dr. Prasad Modak

Department Offerings

SCHOLARSHIPS – GATE

AND

TEACHING ASSISTANTSHIPS

Sr.No.	Program Outcomes	Subjects in curriculum
1	PO1-DESIGN AND PLANNING	Environmental Design Studio-I, II, III Sustainable Development and Environmental Management Environmental Architecture Project Lighting Lab
2	PO2- RESEARCH SKILLS	Elective-I, II, III Research I and II Environmental Laws and Legislations Environmental Architecture Project
3	PO3- TECHNICAL KNOWLEDGE	Research-II Environmental Architecture Project Building Energy Management I and II Tools for measuring sustainability Software Simulation Building Physics I Lighting Lab Advanced Technology and Design Lab
4	PO4- PRACTICAL KNOWLEDGE	Environmental Architecture Project Elective –III (Open Elective) Environmental Professional practice and Training Building Physics I
5	PO5- SENSITISATION AND RESPONSIBILITY	Environmental Design Studio II Environmental Architecture Project Natural Resource Management
6	PO6- COMMUNICATION SKILLS	Research II Elective I Elective II Elective III Environmental Design Studio-I, II, III Environmental Professional practice and Training
7	PO7- SOCIAL RESPONSIBILITY	Environmental Design Studio II Research II

Sr. No.	Electives	Tentative Subjects of Electives
01	Elective I [Sem-1]	<ol style="list-style-type: none"> Efficient Building Materials & Technologies Carbon Footprint and Mapping Global Trends in Sustainability and Outreach
02	Elective II [Sem-2]	<ol style="list-style-type: none"> Environmental Behavior Indoor Environmental Quality Post Occupancy Evaluation and Techniques
03	Elective III [Sem-4]	Open Elective-Choice Based-Interdisciplinary Elective

LAB FOR ENVIRONMENTAL DESIGN AND SIMULATION (LEDS)

LEDS is a state of art research and development lab facility set up at the Department of Environmental Architecture. This lab aims to facilitate strong Industry-Academic tie-ups. The lab facility is accessible to industry partners, research scholars and students.

The lab will assist students and researcher in their on-field/off-field research related to Climate data monitoring, Post Occupancy evaluation studies and design based interventions. The lab is equipped with high end instruments and software required for carrying out field based studies.



**1. Post Occupancy
Measuring Instruments**

**2. Climate Monitoring
Equipments**

**3. Whole Building
Performance Simulation
Software**

**4. Scale down Models of
Low Cooling Technologies**

LAB FOR ENVIRONMENTAL DESIGN AND SIMULATION (LEDS)

SOUND MEASUREMENT

AREAS OF EXPERTISE & SKILLS

A sound level meter is used for acoustic measurements. The diaphragm of the microphone responds to changes in air pressure caused by sound waves.

That is why the instrument is sometimes referred to as a Sound Pressure Level (SPL) Meter. This movement of the diaphragm, i.e. the sound pressure deviation (pascal Pa), is converted into an electrical signal (volts V).

Sound level meters are commonly used in noise pollution studies for the quantification of different kinds of noise, especially for industrial, environmental and aircraft noise.

The current international standard that specifies sound level meter functionality and performance is the IEC 61672-1:2013.

However, the reading from a sound level meter does not correlate well to human-perceived loudness, which is better measured by a loudness meter.

SOUND METER
Units of Measurement
Decibels (dB)

THERMAL IMAGING CAMERA

AREAS OF EXPERTISE & SKILLS

A thermographic camera (also called an infrared camera or thermal imaging camera) is a device that forms an image using infrared radiation, similar to a common camera that forms an image using visible light.

Instead of the 400–700 nanometre range of the visible light camera, infrared cameras operate in wavelengths as long as 14,000 nm (14 µm). Their use is called thermography.

Thermography finds many other uses. For example, firefighters use it to see through smoke, find people, and localize hotspots of fires. With thermal imaging, power line maintenance technicians locate overheating joints and parts, a telltale sign of their failure, to eliminate potential hazards. Where thermal insulation becomes faulty, building construction technicians can see heat leaks to improve the efficiencies of cooling or heating air-conditioning.

THERMAL IMAGING CAMERA

CO2 MONITORING

AREAS OF EXPERTISE & SKILLS

Carbon dioxide sensor or CO2 sensor is an instrument for the measurement of carbon dioxide gas.

The most common principles for CO2 sensors are infrared gas sensors (NDIR) and chemical gas sensors.

Measuring carbon dioxide is important in monitoring indoor air quality, the function of the lungs in the form of a capnograph device, and many industrial processes.

CO2 SENSOR

Units of Measurement
parts-per-million (ppm)
micromol mol⁻¹ (10⁻⁶ mol CO2 per mol of dry air)

INFRARED THERMOMETER

AREAS OF EXPERTISE & SKILLS

An infrared thermometer is a thermometer which infers temperature from a portion of the thermal radiation, sometimes called blackbody radiation emitted by the object being measured.

They are sometimes called laser thermometers as a laser is used to help aim the thermometer, or non-contact thermometers or temperature guns, to describe the device's ability to measure temperature from a distance.

By knowing the amount of infrared energy emitted by the object and its emissivity, the object's temperature can often be determined within a certain range of its actual temperature.

Infrared thermometers are a subset of devices known as "thermal radiation thermometers".

INFRARED THERMOMETER

Units of Measurement
Temperature - C or F

LIGHT METER

AREAS OF EXPERTISE & SKILLS

Lux is a measurement of the overall intensity of light within an environment for any given area or distance from the source.

Lux is the amount of light in an environment perceived by the human eye.

Measuring lighting or the illumination of an environment requires the use of an incident Lux meter or foot-candlemeter. A lux meter is a device for measuring brightness.

It specifically measures the intensity with which the brightness appears to the human eye

LUXMETER

Units of Measurement
lux

ENVIRONMENTAL METER

AREAS OF EXPERTISE & SKILLS

Measures all 5 parameters in illumination, sound, humidity, temperature and air speed.

1. Anemometer uses a low-friction ball bearing mounted wheel design for high accuracy.
2. Humidity meter uses a high precision humidity sensor for fast response time.
3. Light meter uses a photo diode and color correction filter light sensor; spectrum meets C.I.E. photopic.
4. Type K thermometer uses standard type K (NiCr-NiAl) thermocouple input jack suitable for diverse application type K probes.
5. The sound level meter meets IEC 61672 class 2 with "A" frequency weighting and "Fast" time response.

5 IN 1 ENVIRONMENTAL METER

THERMO HYGROMETER

AREAS OF EXPERTISE & SKILLS

Thermo hygrometers are useful for measurements of humidity. Humidity is a representation of the concentration of water vapour in the air where the value is shown as a percent.

Thermo hygrometers have sensors which measure humidity of the air and temperature of the air. They are also used as Data loggers.

Thermo-hygrometers can be used to measure moisture content in various materials including wood, concrete, plaster and bricks.

Thermo hygrometers are very useful in evaluating damage in a warehouse. Many warehouses need to be at an exact temperature with a specific level of humidity. A difference in temperature and/or humidity would mean that the stored products get damaged or even destroyed. Such warehouses are for example those ones that offer flowers and food.

THERMO HYGROMETER

Units of Measurement
Temperature - C or F
Relative humidity - %

WIND MEASUREMENT

AREAS OF EXPERTISE & SKILLS

An anemometer is a device used for measuring the speed of wind, and is also a common weather station instrument. The instruments gives the wind speed in m/s or km/hr

3 Measurements in one instrument.
Air flow: CMM (M3/min) and CFM (FT3/min)
Air velocity: m/s, ft/min, km/h, knots, mile/hr.
Air temperature: Degree C and F.

3 air flow mode: Instant, 2/3rd Velocity Max, Average

Use Low Friction ball vane wheels to make sure high accuracy in high and low velocities.

Recall function for maximum and minimum record
Data hold function. Use fast-response-time Thermistor sensor for temperature measurement.

ANEMOMETER

Units of Measurement
m/sec
Knots/min
Km/hr

Study focus Areas as per Current Environmental Issues & Trends

Current focus areas:

Net Zero by 2070

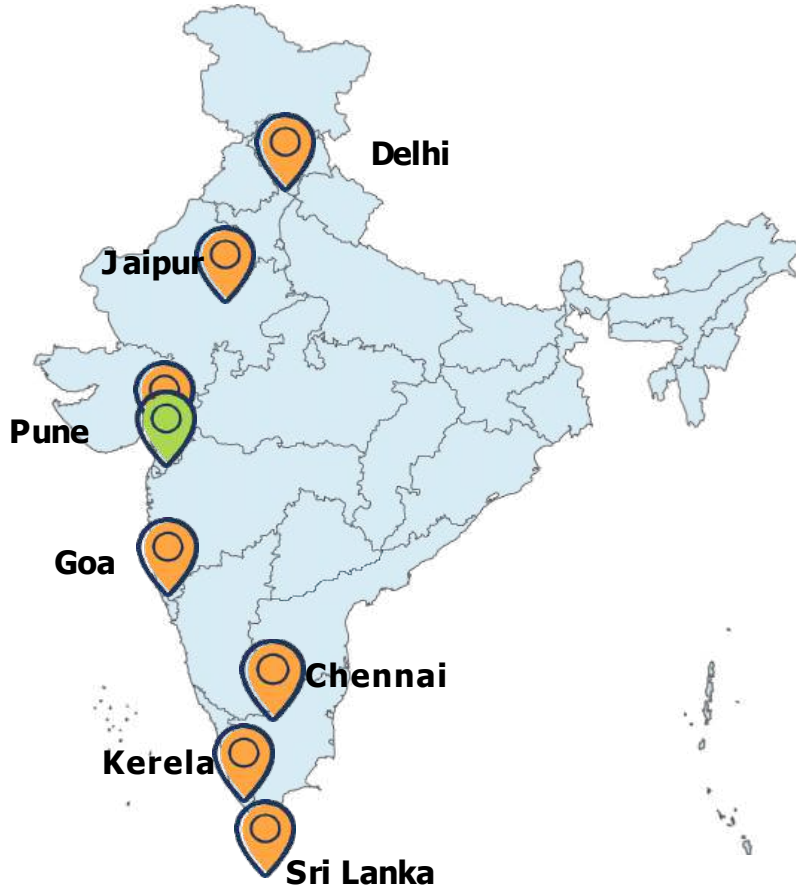
National Action Plan for Climate Change

National Mission for Enhanced Energy Efficiency



- Passive Design Strategies
- Energy Efficient Design
- Zero Energy Architecture
- Sustainable Townships
- Urban Environment Issues
- Sustainable Rural Development
- Smart Cities
- Smart Tourism

ENVIRONMENTAL PLANNING STUDIO (2008-22)



2021: Pune: Climate Action Plan

2021: Pune: Heat wave mitigation action plan

2020: Pune, PCMC, Goa, Mumbai, Nagpur, Nature based blue green solutions to resilience

2019: Chennai, Climate Resilience Strategies for Chennai

2018: Wayanad, Climate Resilience in heritage town

2017: Jaipur, Climate Resilience in heritage town

2016: Pune, Tourism development plan

2015: Srilanka, Master urban design Colombo University

2014: Koyna, Environmental Management

2012 / 2013: Pune, Kasba: Redevelopment of Core City

2011: Goa Development plan 2020

2010: Pune, J.M Road & Narayan Peth Study

2009: Phaltan, Environmental Profiling

2008: Delhi, Yamuna SPA Delhi

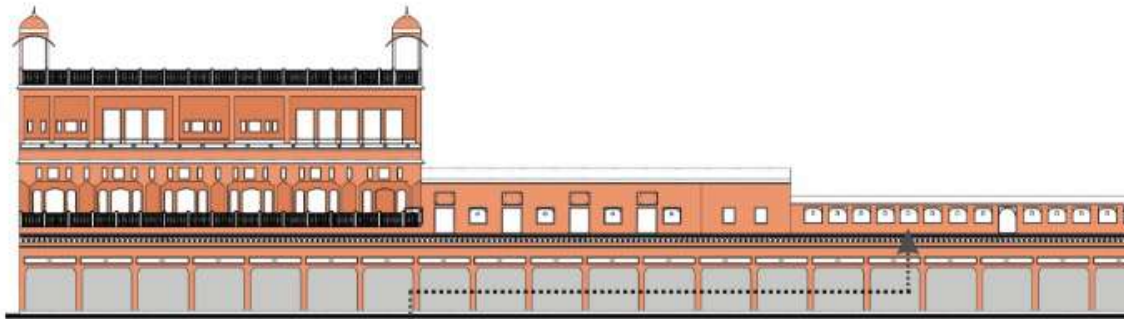
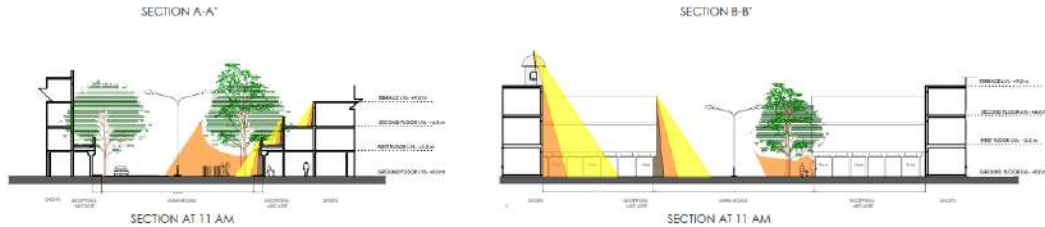
JAIPUR - 2050 RESILIENCE TOWARDS CLIMATE CHANGE



Issue addressed:

1. Identified as most vulnerable city for "climate change"
2. Environmental indicators - Food security, Waste management, Transport, City master planning, Water management, Energy supply and Disaster
3. Sub-urban Urban Morphology

Jaipur Proposal



Understanding how the old city and its climate responsive design to cater climate change and create future vision -

1. Housing cluster development policy for future
2. Reassigning open spaces & Land - use based on existing built typology
3. Designing Thermal Comfort – neighbourhood level using various passive design strategies

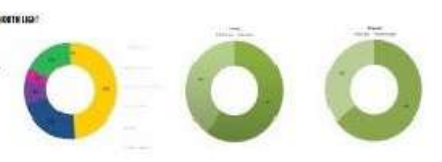


Jaali is an effective substitute for a window (functions). It also helps to maintain the traditional architecture of the city.

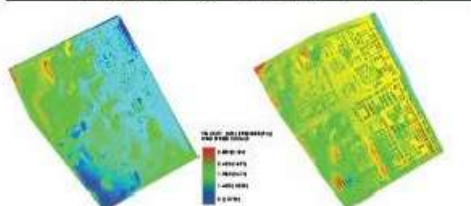
bird feeder -
the street furniture laying shaded under the tree and by the shadow cast by southern facade has a lower temperature and doesn't cause discomfort to the pedestrian coming in contact with them.
The heating is controlled hence the evaporation on the birds feeder on the southern side of the street becomes favorable for placing these bird feeder and other street furniture.

CLIMATE RESILIENT CITIES - JAIPUR

INTRODUCTION
 The climate resilient city is a city that is able to withstand and recover from the adverse effects of climate change. It is a city that is able to adapt to the changing climate and to reduce its vulnerability to the impacts of climate change. The climate resilient city is a city that is able to reduce its carbon footprint and to increase its resilience to the impacts of climate change. The climate resilient city is a city that is able to reduce its carbon footprint and to increase its resilience to the impacts of climate change. The climate resilient city is a city that is able to reduce its carbon footprint and to increase its resilience to the impacts of climate change.



Jaipur Building Bylaws							
Proposed Bldg.	Plot Size(sq.m)	Max Ground Coverage In %	Min setbacks (M)			FAR	Max. Hgt. (M)
			F	S	B		
Independent Residential	50-100	-	1.5-3	-	-	-	8
	100-350	-	4.5	-	3	-	12
	350-1 Hrs	50*	7.5-15	3.5-9	3.5-9	12 *	14
Flats	750-1000	within set back	9	4.5	4.5	1.30	225
	1000-6000	35 *	9.5-15	4.5-9	4.5-9	1.30	225
Group Housing	>3000	35	15	9	9	1.30	225
Com. mixed of No Bldg	450-100	within set back	-	-	-	-	8
	100-250	within set back	3.75	3	3	-	12.5
	750-1000	within set back	9	4.5	4.5	1.30	225
Com. mixed of Complex	1000-1500	within set back	9	4.5	4.5	-	-
	1500-3500	35	12.5-15	9	9	1.30	225
	> 3 Hrs	35	18	9	9	-	Pln B11*



Even though the plot height will affect the way the plot will receive the sun's rays, it is better to have a taller building than a shorter one. This is because the taller the building, the more the sun's rays will hit the building, and the more the sun's rays will hit the building, the more the sun's rays will hit the building.

It is important to consider the height of the building when designing a plot. A taller building will receive more solar radiation than a shorter building. This is because the taller the building, the more the sun's rays will hit the building, and the more the sun's rays will hit the building, the more the sun's rays will hit the building.

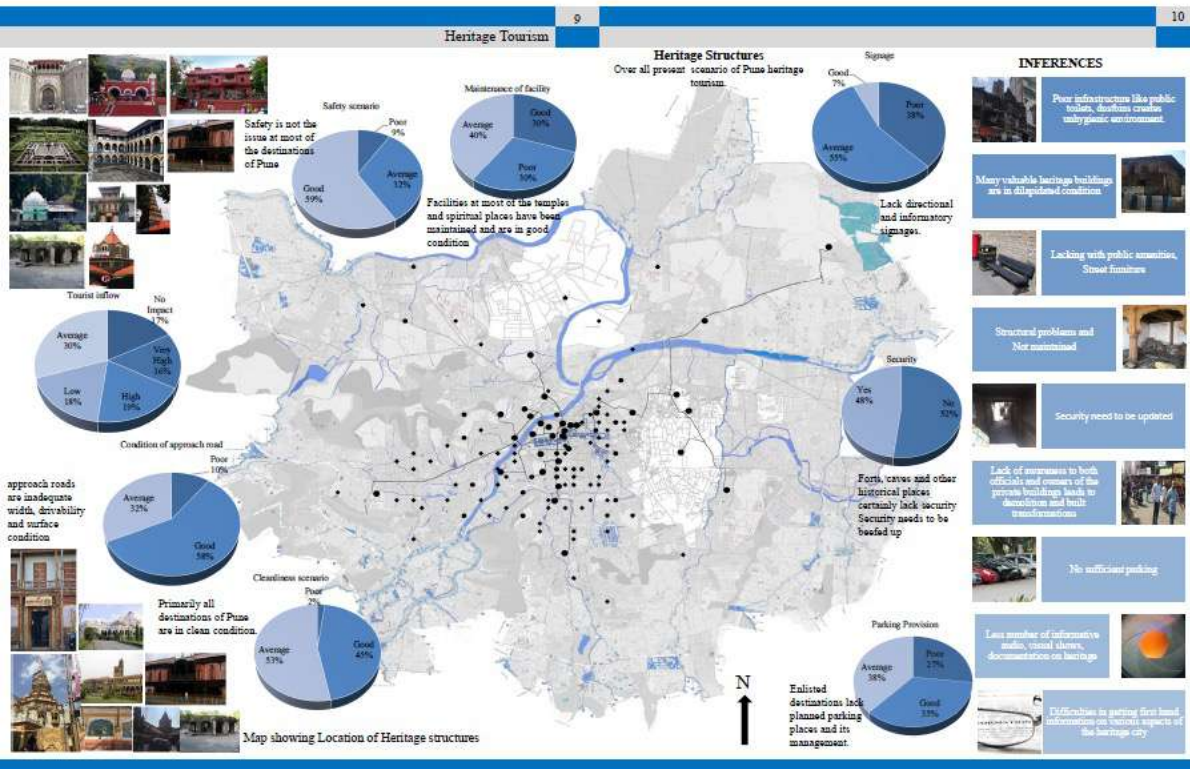
THERMAL COMFORT THROUGH MINIMAL FOOTPRINT

Draw structure

Sectional view

Site plan

SUSTAINABLE TOURISM PLAN FOR PUNE



1. Identity transformation of Pune. Ms. Vandana Chavan, MP had envisioned it as a Tourist destination.
2. Incorporating smart elements into the city fabric and how the city could be developed as a world class tourist city on from Cultural City to Smart city
3. Rediscovering lost heritage buildings for adaptive reuse

CLIMATE RESPONSIVE AND ENERGY EFFICIENT DESIGN STUDIOs

Studio Themes

Climate Responsive
Design



Net Zero Energy
Buildings



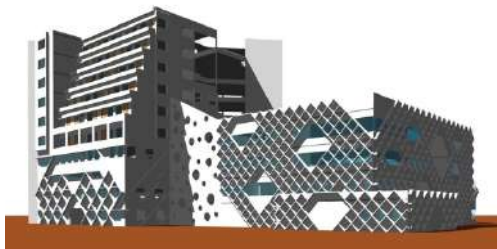
Energy Management
Planning & Energy Audits



Green Building
Certification



Post Occupancy
Evaluation



ECBC Compliant Hospital Design



Redesign of commercial Building, Pune



Energy Audit & Environmental Management Plan for MKSSS campus



Net Zero Energy Housing



PMC Building: Retrofitting & Green Building Certification feasibility



Van Bhavan: Retrofitting office buildings for Energy Efficiency

ENVIRONMENTAL MANAGEMENT AND AUDIT

Energy efficient Retrofitting of Government buildings & Green building Certification



Pune Municipal Corporation, Pune:

- Total Energy saving achieved: **40%**
- Reduction in the water consumption by :**73%**

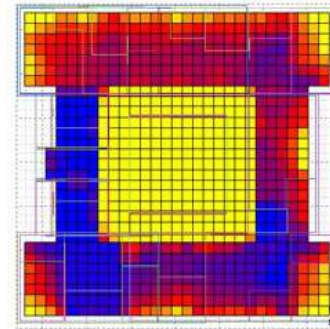


Van Bhavan- Forest Department (Regional office), Pune

- Energy Savings : **19%**
- Annual saving by retrofitting **artificial lighting** : **Rs. 57769.68/-**

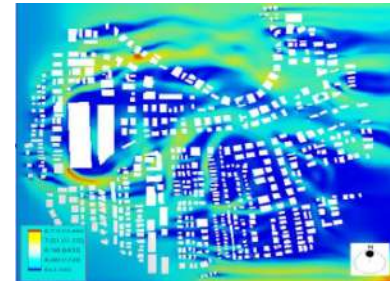


93.21 kWh Energy saved by replacing existing Tube Lights, ACs, Fans.



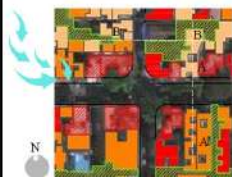
RESEARCH and DISSERTATION

Students undertake Research projects along with their Dissertation Project wherein they are encouraged to work in allied fields of environmental design along with live projects with practical solutions.

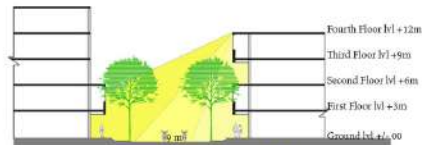


Deriving Methodology For Sustainable Development of Plots In Transit Oriented Development Along Metro Corridor – Case Pune

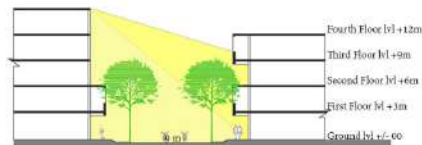
CASE 1



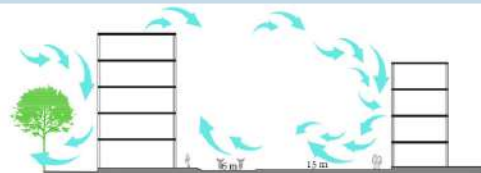
The area has combination of mid rise and low rise structures. Mid rise structures are along the main road.



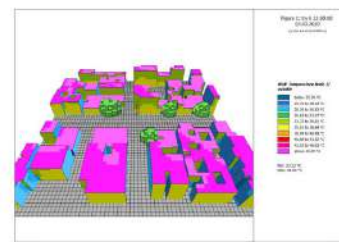
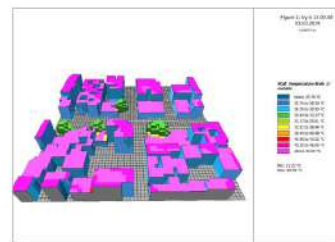
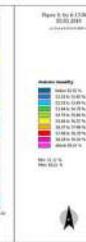
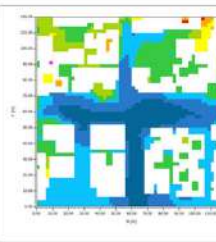
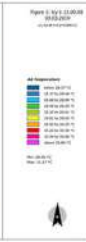
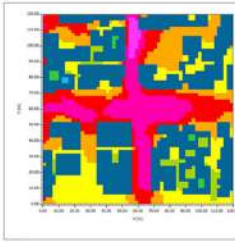
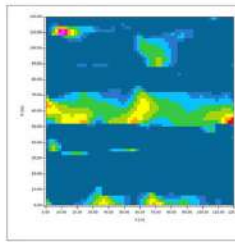
Section A-A' Shadow at 11 am December March August
The streets are shaded throughout year but has maximum shading in the month of August at 11.00 am and the minimum shading in the month of December 11.00 am.



Section A-A' Shadow at 3 pm December March
The streets are not shaded throughout year but has maximum shading in the month of December at 3 pm and the minimum shading in the month of March.



Section B-B' Wind Movement
The buildings with open space of 15m distance adjacent to main road receive good amount of wind.



Light winds are experienced throughout the selected area. Maximum wind is seen on the main road, while minimum wind is seen near the building area. The courtyards and open spaces receive low winds.

Temperature difference of 2 °C is seen on road and in between the building clusters. Temperature is reduced on the road around the tree plantations by 1 °C.

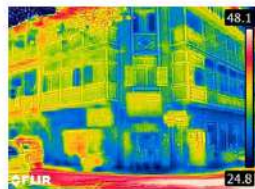
Minimum humidity is experienced on the main road, humidity around the trees is more than rest of the surrounding.

Temperature is less on the Northern facades, the inner open spaces of the buildings are much cooler than the exterior.

Temperature is more on the Southern facades, the surfaces around the trees temperature difference of 2 °C is experienced.



Typical architectural features of the street are use of chajjis resulting in strong horizontal lines, projecting vertical blocks on brackets, balconies with delicate latticed screens cut direct sun and glare of reflected sun in the street.



In the above thermal image, the northern facade of the street which is exposed to sun having more temperature up to 36 °C. Whereas the area under the balcony is shaded having less temperature up to 22 °C.



The streets are not shaded but the trees cast shadow on the street thus making it comfortable for pedestrians.



In the above thermal image, the south facing street which is exposed to sun shows higher temperature. Whereas the area under the balcony is shaded having less temperature up to 22 °C.

Findings

Road - The street was warmer but there was no air movement was noticed in the internal lane. w.r.t. North-South facing street is 1.6:1 resulting in shading of the streets throughout the day.

Orientation - The streets which are East - West oriented show temperature difference from 29.92 - 30.82 °C. The streets which are oriented North - South oriented show temperature difference 30.23 - 30.82 °C. East - West oriented streets show higher temperature difference than North - South oriented streets.

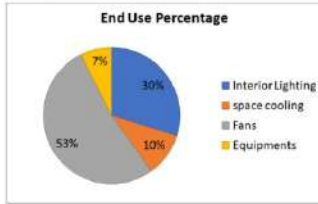
Wind - Difference in wind speed is seen at a distance of 10m where observed speeds vary between is 0.37 to 0.48 m/s to 0.72 to 0.83 m/s

Vegetation - Trees with low foliage with 9m height are seen on the main road, the areas around the tree is lower by 1 °C. The wind is cooled by the vegetation and reaches the buildings.

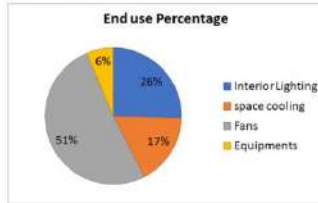
Open space - The open spaces around the buildings with 15m width and courtyards inside the building with minimum distance 4m temperature is lesser by 2°C. There are many open spaces in this area thus helping in better ventilation.

SIMULATION 1: SPLIT AC

SPLIT AC WITH COMFORT SET POINT
TEMPERATURES: 24 C to 26 C



SPLIT AC WITH COMFORT SET POINT
TEMPERATURES: 27 C to 31 C



COMFORT :

Time Setpoint Not Met During Occupied
Cooling for temperatures 24 C to 26 C = 0.00

Total Site Energy: 430,093.22 kWh

Time Setpoint Not Met During Occupied
Cooling for temperatures 27 C to 31 C = 355.33 hours

Total Site Energy: 297,968.48 kWh

COST CALCULATION FOR SPLIT AC:

No. of ACs	72
Average cost of AC unit	Rs. 32,000 Rs
Total set up cost of AC (minimum)	Rs. 5,184,000
Electricity bills and maintenance	2073/ month
Annual operating cost (Total tons x Kw/TR x No. Of Hours/Day x No. Of Days/year x Cost of Electricity/(Kwh) x Operating factor)	Rs.6,840,900

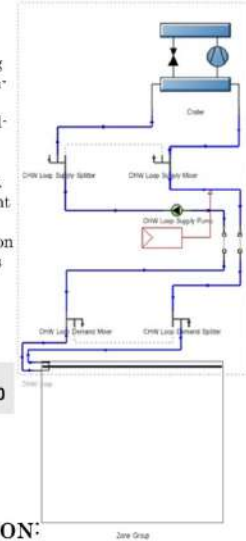
COST CALCULATION FOR RADIANT COOLING

Cost calculation for 2239 sq m area calculation	
Cost of Radiant cooling	Rs.65,19205.84
No. Of hours of operation per day	Rs. 10
No. Of operating days / year	330
Cost of electricity	6.73
Annual Energy Cost (Total tons x Kw/TR x No. Of Hours/Day x No. Of Days/year x Cost of Electricity/(Kwh) x Operating factor)	1,62,245

SIMULATION 2 : RADIANT COOLING

The system is modeled in designBuilder.
The Set point of the water is ket at 23 C
and 25 C .

The system is designed as radiant cooling
with the use of ceiling as a medium for ra-
diation.
Embedded surface system of Radiant cool-
ing is used where heating and cooling
tubes are places while constructing the
system with radiant layer on the exterior.
In this system, plaster is used as a radiant
material.
The complexity of the system in simulation
softwares is the reasonwhy this system is
not used in the building sector.

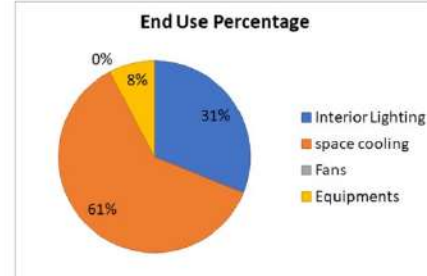


SIMULATION RESULTS :

Time Setpoint Not Met
During Occupied Cooling 306.00

ENERGY PER CONDITIONED
BUILDING AREA
75.04 kWh/m²

TOTAL ENERGY CONSUMPTION:



STUDY OF OCCUPANT WELL-BEING IN THE RESIDENTIAL BUILT ENVIRONMENT

BY: CHETANA AIRANI (2019-21)

GUIDE: PROF. PROF. NAMRATA DHAMANKAR- JADHAV

ABSTRACT

With the increasing demand in residential typology of buildings in urban and rural areas, and the time we spend indoors, it has become crucial to understand the impact of built environment on our health and well-being. Due to the current Corona virus pandemic, people are forced to spend most of their time at home, but are also expected to work or/and study and function like we were before the pandemic. With the upcoming Green Building Rating systems which claim to produce healthier buildings and occupants than conventional buildings, there is a need to assess and quantify the parameters of built environment which affect our environmental comfort. *The paper examines which evaluated indoor environmental parameters and building features mostly affect occupants' satisfaction in residential buildings.

The study analyses data from a survey administered to 96 occupants in 7 buildings in a single gated housing colony. The survey uses 7-point ordered scale questions pertaining to satisfaction with indoor environmental parameters, building features and psychological wellness factors. The objective of this study was to understand how the environment around us affects our cognitive responses, and quantifying these responses. Results suggest that most occupant comfort parameters are significantly related to their health and psychological well-being, with thermal comfort being the major aspect of health outcomes. Satisfaction with comfort parameters may not necessarily mean correlation with real time data for every case suggesting that their significance on the final health outcome of the occupant is not considerable.

*Under the WELL Global Research Agenda, researchers have identified key issues and top research questions that study the relationship between buildings and health which is ever increasing. Based on their key topics, this paper focuses on occupant satisfaction and comfort around air quality, thermal conditions, lighting and acoustics and their potential link with negative health and performance outcomes.

This study is meant to fulfil the gap in research related to cognitive health outcomes which are a result of our immediate built environment. These ideas provide only an initial foray into the domain of residential space, but they hint at the productive roles that homes and other spaces could play in psychological theorizing and research.



KEYWORDS

*Occupant environmental satisfaction, occupant comfort, psychological wellness, cognitive health, well-being, indoor environment.

CONTACT

BNCA's Department of Environmental Architecture and Planning,
mail@bnca.ac.in
website: bnca.ac.in
fb: BNCA Environmental department
insta: @bnca_environment
linkedin: Department of environmental architecture and planning



EXPLORING THE POSSIBLE RE-USES OF USED CIGARETTE BUTTS IN THE CONSTRUCTION PRODUCTS

BY: AISHWARYA PALWE (2019-21)

GUIDE: PROF. PRAJAKTA KULKARNI

CO-GUIDE: PROF. MAHESH BANGAD

ABSTRACT

Filters are intended to reduce the harm caused by smoking by reducing harmful elements inhaled by smokers. However, they do not make cigarettes safer. While laboratory tests show a reduction of "tar" and nicotine smoke, filters are inefficient at removing gases of low molecular weight, such as carbon monoxide. The main reason behind smoking cigarette is nicotine. Because nicotine immediately dissolves or absorbed in blood, that's why people and young generation started smoking. People take nicotine forgetting immediate refreshment like caffeine, tannin. When any person take Cigarette after smoking last part remains called "filter/butts" and now butts can be seen littered almost everywhere. The real environmental culprit is the filter. The main ingredient in the manufacture of cigarette filters is a product called cellulose acetate, a type of slow-biodegrading toxic plastic. The Aim of this study is to explore the possible reuses of used cigarette butts in construction products. In order to achieve this aim it's important to study and understand the properties of Cellulose Acetate and Cigarette Butt Filters so that they can further be experimented in the construction products. It was observed that the key properties of these materials are that the material has Good toughness, Deep gloss, and high transparency and has a feel that can be described as "natural". The need for the topic was to overcome the environmental problems cause due to these cigarette butts by reusing them and making the best use of them in the construction industry.

The methodology was based on Secondary study that is Desktop study of existing literature and experiments done and Primary study that is to conduct small experiments to check the feasibility of the use of the material. Based on the literature Review the material was experimented with respect to internal panels and the expected outcomes were to have a product that is Water absorbent, Moisture Resistant, is easy to assemble and has a good finish and has good thermal insulation and is strong in nature.



KEYWORDS

*cigarette filters, construction material, environmental hazard

CONTACT

BNCA's Department of Environmental Architecture and Planning,
mail@bnca.ac.in
website: bnca.ac.in
fb: BNCA Environmental department
insta: @bnca_environment
linkedin: Department of environmental architecture and planning



ACHIEVEMENTS at the DEPARTMENT

Royal Institute of Fine Arts, Sweden sponsored by



STUDIO 1 : 2010-2011

River-Front Development Plan, JM

Royal & Narseyan Path
Studying the lifestyle and city structure of old versus new. Project area was JM Road and Narseyan Path with the Mula-Mutha River connecting the new city with the old.



The Department had conducted joint planning studios with Royal University of Fine Arts, Sweden for 3 years.

Under this joint studio program, students and faculty member every year from the department received full funding to visit Stockholm, Sweden to be a part of the exhibitions cum lecture series of their works on the joint studio conducted in that year.



STUDIO 2 : 2011-2012

Development plan 2030 for Goa

This studio looked at exploring the Urban Rural linkages in Goa

STUDIO 3 : 2012-2013

Sustainable Development plan for core city- Kaba Path, Pune

Studying the core city area of Pune and looking at the approach of Sustainability in Conservation

'Swedish Avenue Design 2018'



by

The competition was about smart urban street designing considering sustainability and modern mobility in mind & in context of Swedish street design. A team of 1st yr. M.Arch students were participants and got selected for the final jury presentation.

City School of Architecture , Colombo

by



The department has worked on a live project in Colombo, Sri Lanka in a joint studio with the masters department of the city school of architecture, Colombo. 17 students and 2 faculty members went to Sri Lanka and participated in a 3 day long joint studio and after coming back worked on the proposals that are now sent to the authorities in Colombo.



'Race to zero 2018'

by



U.S. DEPARTMENT OF ENERGY

Team REED 5 from BNCA's first year of environmental architecture department was selected as a finalist team in 'Race to zero 2018' competition organized by U.S. Dept. of Energy and successfully presented their project in finals at Denver.



Dr. Banuben Nanavati College of Architecture for Women



Paper presentation at YRI Conference, Austria

Paper on "Energy Efficiency for Terachand Hospital, Pune" written by Priyanka Kulkarni & Aishwarya Bhosale was selected for an Young Researchers International Conference (Austria) for oral presentation by the scientific committee, World Sustainable Energy Days' 2016

Intention of the project was to reduce Energy Consumption and enhance Water Efficiency of Terachand Hospital with respect to ECBC Compliance.



"Green College Clean College Trophy", Pune

by



The competition of was announced under Kirloskar Vasundhara International Film Festival festival 2018. Student's team from Dept. of Environmental architecture under guidance of Prof. Prajakta Kulkarni had taken part in this competition and received 3' prize.



COMPETITIONS & AWARDS

US DOE's Solar Decathlon finalists:



Finalist at U.S. DOE's 'Race to Zero' International Design Competition : 2020



Finalist at U.S. DOE's 'Race to Zero' International Design Competition : 2019

Solar Decathlon India:



2nd Prize, Community resilience Shelter category : 2022



2nd Prize, Community resilience Shelter category : 2021

COMPETITIONS & AWARDS



'1st prize' in National Level competition on 'Solutions for carbon neutral campus ' organized by IIM Kozhikode. 2022-23



2nd Prize at HOSMAC Students Design Competition, 2018



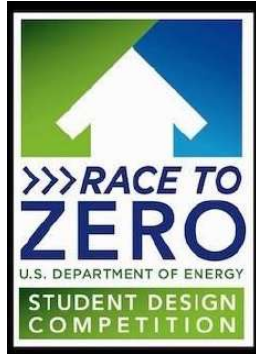
2nd Prize (2021, 2022) and 3rd Prize (2019, 2020) at Vasundhara's Green College Clean College Trophy



Pune Municipal Corporation 'Swachh competition' Award

Industry Experience while learning

Students working as a Mentors & Technical resource persons for
US DOE's Solar Decathlon & Solar Decathlon India



Industry Experience while learning



5 star hotel Energy Audit work Published in Govt. gazette: (April 2020)

Energy Audit of 5 five star hotels in Pune. The work was conducted for Bureau of Energy efficiency (BEE). It is published in govt gazette exactly as per report prepared by students.

EVENTS & ACHIEVEMENTS

Webinar Series (9,16,23 Apr 2021)

**TOWARDS LOW-CARBON CLIMATE RESILIENCE:
How architects can deliver change**

TOWARDS LOW-CARBON CLIMATE RESILIENCE

HOW ARCHITECTS CAN DELIVER CHANGE

ONLINE WEBINAR SERIES



**6 PM
ON
FRIDAYS**

9 APR
CLIMATE CHANGE AND
ARCHITECTURAL PRACTICE

16 APR
TECHNOLOGIES FOR
RESILIENCE BUILDING

23 APR
THE WAY FORWARD AS
A PROFESSION WITHIN A CLIMATE
CHANGING WORLD

*CERTIFICATE WILL BE AWARDED TO PARTICIPANTS WHO ATTEND ALL 3 SESSIONS
*OPPORTUNITY TO BE MENTORED BY EXPERTS ON SUSTAINABLE ARCHITECTURE

*HOSTED ON **zoom**





TO REGISTER
FOURNIMA@SAMUCHT.COM

**Clean Air for blue skies webinar (4 sept 2021):
International Day of Clean Air for blue skies:**

Clean Air

Inside Out

#WorldCleanAirDay
#CleanAirForAll

International Day of Clean Air for blue skies 

Outdoor Air Pollution is a growing concern for Indian cities with 26 cities being in the top 50 polluted cities in the world ranking in 2019. Along with this, Indoor Air Quality (IAQ) also needs urgent address, since 90% of our time is spent indoors. IAQ has a significant and direct impact on the health and well-being in buildings for its occupants. Green Buildings can be a key intervention strategy to ensure healthy indoor spaces for occupants and mitigate the adverse effects of indoor air pollution. Outdoor air pollution on the other hand needs policy and advocacy level interventions along with an aggressive implementation action plan.

The Clean Air-Inside Out webinar will discuss and deliberate on how various actions and steps could be taken by stakeholders to combat air pollution in cities as well as in the built environment.

Speakers-



Dr. Prasad Modak
Executive President, EMC
Founder President
Society for Indoor Environment



Prarthana Borah
India Director
Clean Air Asia



Dr. Victor Shinde
Sector Coordinator
Water & Environment
NIUA

Date: FRIDAY 4TH SEPTEMBER 2020
Time: 4:30 PM to 6:00 PM
Venue: Zoom

Organising Team: **Narmada Damankar** Faculty, DEAP | **Dr. Sujata Kanve** HOD, DEAP | **Pragna Kulkarni** Faculty, DEAP

Supported by: **Dr. Arunag. Kalihay** Principal, INCCA





Organised by

DR. BHANUBEN NANAVATI
COLLEGE OF ARCHITECTURE
FOR WOMEN




Supported by

EVENTS & ACHIEVEMENTS

DEAP Conversations Series, 2020–

Interactions with the industry experts in the field of environment



Paper Presentation by Student at International Conferences



Joint Workshop with RICS, Amity University, 2017, 2019

Urban Lab 2018 – TU Berlin, IGSI & BNCA



ECBC Capacity Building Workshops: 2018-19



Volunteering at the Green Build 2017

Joint studio with M.Arch students of Satyabama University, Chennai 4th to 7th February 2020



An International Online Collaborative studio - About Pune City With Uttah University 19th october to 30th october, 2020



in recognition of outstanding academic achievement

AWARD OF EXCELLENCE

Student Collaboration/
Urban Design

Dr. Bhanuben Nanawati
College of Architecture for
Women (BCA)

Department Landscape Architecture, Architecture, Digital
Architecture and Environmental Architecture
BCA/CEI International Collaborative Workshop, Fall 2020

Embracing the Mutha River: An Urban Design Study of Sustainable Futures | Pune, India

Project collaborators:
Dr. Bhanuben Nanawati College of Architecture for Women
(BCA), Pune India + Department of Landscape Architecture &
Environmental Planning, Utah State University, USA

BCA Students:
Manika Shinde, Shruuti Kulkarni, Sayali Kulkarni, Madhavi Kulkarni,
Riya Mundada, Pratyaksha Menkar, Namika Hegde, Chitra Jain,
Rajya Shinde, Darshana Desai, Dnyaneshwari Khadkekar,
Srinani Gendhi, Shivani Nambekar, Komal Arora, Pooja Joshi,
Nishamini More, Venkisha Sathwik, Nehal Datta, Purni
Pimpalgaonkar, Janhavi Rajwade, S. Prashika, Neeru Bhalani,
Yashvi Patil, Jantavi Phansavkar, Nagan Anand, Shweta Takte,
Sakshi Patil, Anika Patil, Tanaya Shah, Anika Singh, Sarika
Kajane, Sakshi Waghmare, Shivani Awati, Madhvi Patil, Shweta
Bhosle, Rutika Phansavkar, Chaitrini Natar, Shweta Jain, Rachana
Patil, Pratiksha Patil, Aditya Aji, Pratiksha Shah, Hrushika
Ahoir, Anurika Shinde, Karika Sathe, Arunika Gendhi,
Anvika Chitambar, Anvika Chitambar, Karishma Chitambar, Sowmi
Nair, Shreemika U, Pratiksha Dhole, Vinita Patil, Pranshi Patil,
Anika Mhatre

presented by



BCA Mentors:
Sneel Sataranavathe, Project Coordinator & Head of Department
of Landscape Architecture, President Elect, Dr. Anurag Keshavn,
Principal, Shruji Joshi, One Village Sustainable, Digita
Karni, Vinita Patil, Vinita Patil, Anika Khosla, Anvika
Khosla, Pragati Kulkarni, Neha Anand, Neel Tripathi

ASLA U.S. President - Sethi Bockhorst
05/03/2021



in recognition of outstanding academic achievement

HONOR AWARD

Student Collaboration/
Urban Design

Dr. Bhanuben Nanawati
College of Architecture for
Women (BCA)

Department Landscape Architecture, Architecture, Digital
Architecture and Environmental Architecture
BCA/CEI International Collaborative Workshop, Fall 2020

Embracing the Mutha River: An Urban Design Study of Sustainable Futures | Pune, India

Project collaborators:
Dr. Bhanuben Nanawati College of Architecture for Women
(BCA), Pune India + Department of Landscape Architecture &
Environmental Planning, Utah State University, USA

BCA Students:
Manika Shinde, Shruuti Kulkarni, Sayali Kulkarni, Madhavi Kulkarni,
Riya Mundada, Pratyaksha Menkar, Namika Hegde, Chitra Jain,
Rajya Shinde, Darshana Desai, Dnyaneshwari Khadkekar,
Srinani Gendhi, Shivani Nambekar, Komal Arora, Pooja Joshi,
Nishamini More, Venkisha Sathwik, Nehal Datta, Purni
Pimpalgaonkar, Janhavi Rajwade, S. Prashika, Neeru Bhalani,
Yashvi Patil, Jantavi Phansavkar, Nagan Anand, Shweta Takte,
Sakshi Patil, Anika Patil, Tanaya Shah, Anika Singh, Sarika
Kajane, Sakshi Waghmare, Shivani Awati, Madhvi Patil, Shweta
Bhosle, Rutika Phansavkar, Chaitrini Natar, Shweta Jain, Rachana
Patil, Pratiksha Patil, Aditya Aji, Pratiksha Shah, Hrushika
Ahoir, Anurika Shinde, Karika Sathe, Arunika Gendhi,
Anvika Chitambar, Anvika Chitambar, Karishma Chitambar, Sowmi
Nair, Shreemika U, Pratiksha Dhole, Vinita Patil, Pranshi Patil,
Anika Mhatre

presented by



BCA Mentors:
Sneel Sataranavathe, Project Coordinator & Head of Department
of Landscape Architecture, President Elect, Dr. Anurag Keshavn,
Principal, Shruji Joshi, One Village Sustainable, Digita
Karni, Vinita Patil, Vinita Patil, Anika Khosla, Anvika
Khosla, Pragati Kulkarni, Neha Anand, Neel Tripathi

ASLA U.S. President - Sethi Bockhorst
05/03/2021

JOINT STUDIOS



Joint Planning Studio with KKH, Sweden



Joint Planning Studio with City School of Architecture, Colombo, Srilanka



Joint Planning Studio SPA, Delhi



Environmental Economics Joint workshop with Rics, Amity University 2019

INITIATIVES and EVENTS

World Environment Day ,5 June 2019 E-waste collection Drive



Give US your e-WASTE & Plastic Waste from 5th June to 15th June 2019

With the increase in consumption of electronic and plastic goods, the generation of this waste is also increasing

What to give Us?

- Cellphones (Replaced every 20 months)
- Desktop computer (Replaced every 6 years)
- Television (Replaced every 10+ years)
- Portable music player (Replaced every 2 to 3 years)
- DVD player (Replaced every 4 to 5 years)
- Printer (Replaced every 3+ years)

All waste raised due to discarding electronics, plastic bags, bottles, packaging used by you and me

We will sort out the waste disposed off by you and

DONATE . RECYCLE . REUSE

Collection Centre: E-waste collection bin is placed near Canteen, Ground floor, BNCA

Organized by: BNCA Dept. of Environmental Architecture

World Environment Day 5 June 2020: Reduce Plastic: awareness drive



Like Share Suggest Edit ...

It's not yours, not mine, it's ours. So, Protect your mother who nourishes you. BNCA Environmental Department wishes all "A Happy World Environment Day"

45 3 comments 10 shares

Like Comment Share

https://www.facebook.com/pg/BNCA-Environmental-Department-1272037549550062/posts/?ref=page_interal

International Ozone Day: 16-23 Sept 2020: Awareness drive week

International Day for the Preservation of the **Ozone** Layer 2020

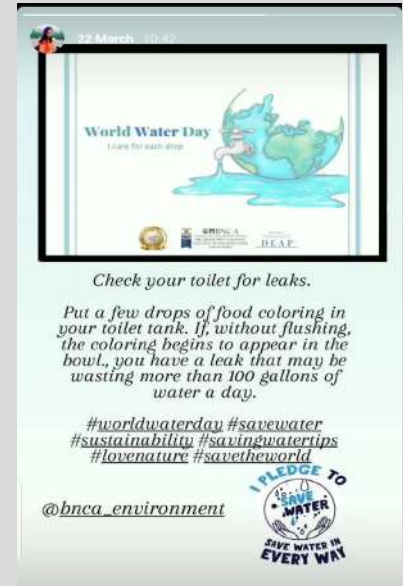
#OZONEFORLIFE



Participate by: BNCA DEAP

#Take the ozone preservation pledge today! 16th - 23rd September 2020

World Water Day 22 March 2021: Water conservation Awareness drive



World Water Day
Leave no tap dripping

Check your toilet for leaks.

Put a few drops of food coloring in your toilet tank. If, without flushing, the coloring begins to appear in the bowl, you have a leak that may be wasting more than 100 gallons of water a day.

#worldwaterday #savewater #sustainability #savingwatertips #lovenature #savetheworld

@bnca_environment

PLEDGE TO SAVE WATER SAVE WATER IN EVERY WAY

INITIATIVES and EVENTS



Conference, Resilient Cities, 2018



Conference, Rivers of Pune, 2017



Conference, Smart Tourism , 2016

Enreach
Eco circle at BNCA

PLEASE COME AND JOIN US!
Seed Collection Drive

Initiating a seed collection drive within the campus for afforestation within Maharashtra.

15TH MARCH TO 21ST MARCH, 2017
10 AM TO 3 PM

eat your favorite fruit, wash the seeds → sun dry them and put it in a pouch → drop them in the collection box at BNCA courtyard

As initiative by Department of Environmental Architecture

Enreach
Eco circle at BNCA

PLEASE COME AND JOIN US!
World Forestry Day

seed donation drive for afforestation

MARCH 21, 2017
10'CLOCK IN THE MORNING

As initiative by Department of Environmental Architecture

Enreach
Eco circle at BNCA

PLEASE COME AND JOIN US!
Water Reuse Drive

Lets clean the college using extra water, which is thrown away everyday!

learn more with the **STREET PLAY**

22ND MARCH, 2017
10 AM TO 3 PM

Don't throw the residual water → collect in the container in courtyard → use the water for cleaning & gardening

As initiative by Department of Environmental Architecture

Give US your e-WASTE
From 5th June to 16th June 2017

With the increase in consumption of electronic goods, the amount of e-waste is also increasing.

What is e-waste?

- Cellphones (Residual every 18 months)
- Desktop computer (Residual every 3 years)
- Television (Residual every 10-15 years)
- Portable music player (Residual every 8 to 10 years)
- DVD player (Residual every 4 to 6 years)
- Printer (Residual every 10 years)

All waste caused due to discarding electronics used by you and me.

We will sort out the e-waste disposed off by you and

DONATE RECYCLE REUSE

Collection Centre
Room no. 411, 4th Floor,
B.N.C.A. Campus
Kamajaga Park
Thane 400014-400
Shrihar, Shrihar

Organized by
Dept. Of Environmental Architecture
BNCA

COLLABORATIONS



Ministry of Environment and Forests
Government of India



Darode-Jog
PROPERTIES
Commitment • Quality • Innovation



DELHI DEVELOPMENT AUTHORITY
विकास प्रविष्टि



Council of Architecture



सर्वे कर्महिते भवेयम्
पुणे महानगरपालिका



BUREAU OF ENERGY EFFICIENCY
Government of India, Ministry of Power



Kungl. Konsthögskolan | Royal Institute of Art



School of Planning and Architecture, New Delhi



sefaira



Savitribai Phule Pune
University



U.S. DEPARTMENT OF
ENERGY



GRIHA



teri



MEOR संसृजन



PERSISTENT



Eco House
Building a Better Tomorrow

Research in
Germany
Land of Ideas



Indo-German
IGSi
Smart Initiatives



CBALANCE



Indian Green Building Council



KIRLOSKAR
Vasundhara
Environment • Wellbeing • Energy • Air • Water



Sida
SWEDISH INTERNATIONAL DEVELOPMENT
COOPERATION AGENCY



CONSULATE GENERAL
OF SWEDEN
Mumbai



sustainability
initiatives



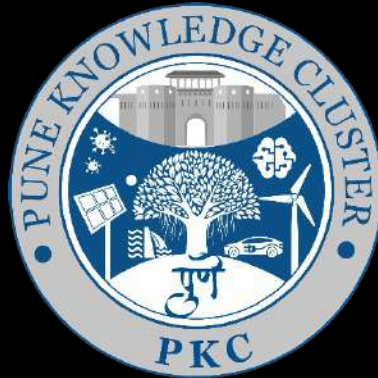
RICS



GOVERNMENT OF INDIA

COLLABORATIONS

Memorandum of Understanding
with Department



Free software
licenses for
students & faculty



Centre for
conducting ECBC
training programs



Conducting joint
studios under the
Youth Program

Placements

100% Placements



Vishakha Bhandare
*Government of Maharashtra Sustainability
Consultant ECBC & ENS Cell*



Aakriti Sachdeva
Senior Project Officer at GRIHA Council



Neha Sagaam
*Associate counsellor at CII - Indian Green a
building Council (IGBC)*



Kanchan Sarbhukan-Sidhaye
Sr. Associate, Vke: Environmental



Amruta Parade
*Principal Consultant- sustainability WSP
India*



Priyanka Kulkarni
*Research Fellow at International
Sustainability Academy (ISA)*



Contact us:

amol.hinge@bnca.ac.in

enreachecocircle@gmail.com

<https://www.bnca.ac.in/academics/masters-of-environment-architecture/>