

E-MAARAT

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ACADEMIC YEAR 2017-18

DEPARTMENT OF CIVIL ENGINEERING


ईमारत

THAKUR COLLEGE OF ENGINEERING AND TECHNOLOGY



The Thakur College of Engineering & Technology (TCET) was established in academic year 2001-02 with a clear objective of providing quality technical education in tune with international standards and contemporary global requirements. The College is recognized by All India Council for Technical Education (AICTE) & Govt. of Maharashtra and is affiliated to the University of Mumbai (UOM). All the courses at the U.G. level, eligible for accreditation in 2011 i.e. Electronics & Telecommunication (EXTC), Information Technology, IT and Computer Engineering CMPN) were accredited by NBA for three years w.e.f. 16.9.2011. Moreover, these programmes are also given permanent affiliation w.e.f. A.Y. 2015-16 onwards.

The management's commitment to excellence and relevance in technical education is reflected in the marvelous infrastructure that is comparable to the finest institution of its type in the country. The imposing five-storied building, housing state-of-the-art computer laboratories, spacious classrooms, well equipped laboratories, workshops, computer centre with server room, a well-stocked library, wide and well lit clean corridors and a large canteen, conference hall, seminar halls has set new standards in providing facilities of international level.

DEPARTMENTAL OBJECTIVES

DEPARTMENTAL VISION

"To become a department of national relevance in the field of Civil Engineering."

DEPARTMENTAL MISSION

The department of Civil Engineering is committed to provide undergraduate students with sound knowledge in the field of civil engineering, and build in them leadership and managerial skills along with inculcating the culture of life-long learning and social sensitivity.

DEPARTMENTAL MENTOR'S MESSAGE



Dr. Sanjay Kumar
Departmental Mentor
PhD (Mechanical Engg.)
M.Tech (Industrial Engg. &Management)
B.E (Production Engg.)

It gives immense pleasure and feel proud to be a part of 2nd edition of civil engineering department e-magazine, E-MAARAT. This department is the youngest department of college. First batch will pass out in the year 2018. In short span, department has shown tremendous potential in academic, co-curricular and extra curricular activities.

Apart from regular academic activities, faculties & students are encouraged for R & D activities. They are publishing technical papers in conferences, participating in different inter and intra competitions. Students are also guided for higher study competitive examinations, such as GATE, GRE, etc.

For overall development, co-curricular and extra curricular is the need of hour along with academics. All these activities act as value addition that enhances prospect of placement and higher studies.

I congratulate, all faculties, staff and students for contribution and effort.

E-MAARAT presents insight of civil engineering department.

HOD'S MESSAGE

Dr. Seema Jagtap



Associate Professor &
HOD

QUALIFICATION:

Ph.D. Technology
(Civil Engineering)

M.Tech Civil
(Hydraulics Engineering)

B. E.(Civil Engineering)

I am very pleased that we have successfully published the second edition of our department magazine E-maarat.

The technical magazine is the combined effort of the student,the faculty and the magazine team. It also give a first hand experience about what is going on the industry at this time,through the interview that had been done.

The magazine has worked as a platform for the presentation of unique ideas,for students and the faculty.The magazine article gives an insight about various aspect of civil engineering.

The magazine provides to be a source of knowledge. It tries to bridge the gap between theoretical knoweledge and practical application of civil engineering.

I would like to congratulate the editorial committee and faculty members for helping and working together to publish this magazine. Thank you for putting the effort required. I hope the magazine helps to rejuvenate the perspective of civil engineering and the magazine is a success.

FACULTY INCHARGE MESSAGE

It gives me immense pleasure to present the second issue of our technical magazine **E-MAARAT.**

The technical magazine is one of the best platforms for our students to put forward innovative ideas.The magazine intends to bring out the creativity and flambouyance of the minds of the students.

The magazine helps to create a deeper understanding for civil engineering and its various aspects.It gives students opportunities to create something innovative and original. It is a platform which is a development of the students.

It is an initiative to evoke the habit of reading in students where every minute there is something new to learn. We have tried to make the magazine informative as well as fun.

On concluding note,I would like to say all the best to students for their future endeavours.

Mrs. Rutuja Sjinde



Assistant Professor &
Faculty In-charge

QUALIFICATION:

M.E
(Water Resources &
Environmental Engineering)

B.Tech (Civil)

MESSAGE FROM EDITORIAL DESK

Civil engineering is an integral part of our lives. It has been practised for thousands of years.

A lot of improvement has taken place in structures as well as methods of construction, over the years. In this issue, we are trying to highlight this transition and the development that have taken place.

From the use of stones as building blocks to use of burnt bricks. From load bearings structures to framed structures, civil engineering has transitioned a lot. Man has built extremely tall structures by using structural designs. Nowadays green structures are gaining a lot of popularity. They try to preserve the environment and minimize the effect of concrete structures on the ecological system.

The technical magazine provides as a platform for students to present original ideas. It helps to bridge the gap between the theoretical knowledge and the industry.

We hope everyone enjoys the magazine

-Surbhi Sawant
(Chief Editorial Head)



MESSAGE FROM EDITORIAL DESK

Civil engineering is one of the most important and oldest fields of engineering. Our life would be incomplete without civil engineering. All the structures buildings around us are the creation of a civil engineer. We are always going to need shelter. We are always going to need dams, roads, bridges and drainage facilities. Thus, the need for Civil Engineering is never going to cease.

The main aim of magazine is student participation. Partcipation of students is conducted by arranging competition ,conferences, opportunities to interact with practicing professionals. This not only helps the students to learn about the construction industry but also instills in them interest in the field and courage of approaching the oncoming professional life.

The students and the faculty members have worked very hard in putting together the magazine. We hope it is a success.

-Suraj P. Mishra
(Vice Chairperson of
CONCRETE CIVIL)



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INDUSTRIAL VENTURE



DR.E.Sreedharan
Principal Adviser
Delhi Metro Rail Corporation LTD

1. Can you tell us a little about your journey from a civil engineer to your present fame and status?

Ans. I did my Civil Engineering from Govt. College of Engineering, Kakinada, passing my BE (Hons) in April 1953 with first class and as first in the University. After a short tenure as Lecturer in Civil Engineering in Kerala Poly Technic, Kozhikode and later as Sub-Engineer in Bombay Port Trust, I joined the prestigious Indian Railway Service of Engineers in December 1954. Starting as an Assistant Engineer on Southern Railway, I rose to the level of General Manager of Western Railway and then got promoted as Member Engineering, Railway Board (the highest technical post on Indian Railways) and retired on 30th June 1990. After retirement, I was given the responsibility of the prestigious Konkan Railway, a 760 Km long Railway

line from Bombay to Mangalore, which was completed in 7 years time. Thereafter, Govt. gave me the responsibility of Delhi Metro as Managing Director, Delhi Metro Rail Corporation Ltd. After completing phase one and phase 2 of Delhi Metro, I finally retired from DMRC on 31.12.2011. Since then, I am working as Principal Adviser, DMRC, assisting many metros now coming up in the country.

2. Can you say some words on the progress of the Mumbai metro?

Ans. In the city of Bombay, 11Kms of elevated Metro line is in operation from Ghatkopar to Andheri. Now a 23 Kms underground line has been just started from the International Airport to Colaba. Another two Metro lines (both elevated) are also under construction for a total length of about 20 Kms.

3. Can you share one best memory and one worst memory from your college life?

Ans. My best memory was when I got the prize for the best article from the Civil Engineering Association in 1952. My worst memory was when I was not selected for the State Foot Ball Team though I was then the captain of Engineering College Foot-Ball Team.

4. Since you're an inspiration to many, who was your role model when you were a college student?

Ans. As a college student, my role model was, no doubt, Prof. Seethapathi, HOD, Civil Engineering Department.

5.How would you encourage more people to take up civil engineering?

Ans. In all developmental projects, civil engineering constitutes 80 to 90 percent of the Project cost. The country is on the thresh-hold of huge developmental activities and many competent Civil Engineers are needed for the country.

6. Why did you choose civil engineering as an academic career option?

Ans. I was keen to get into the Indian Railway Service of Civil Engineers. Civil Engineers had a better chance to get into the Railways because the number of vacancies was too many. Therefore, I opted for Civil Engineering.

7.what would you suggest to the engineers for further studies, from abroad or in India itself?

Ans. Studies abroad are very expensive – almost Rs.1.00 crore for 2 years. Only rich can afford this. Scholarships are very few. Today, India has got very good institutions which can offer higher studies and research facilities. After taking a PG or Doctorate, they can get the opportunity for higher education abroad with scholarship. But, after they finish studies, they should come back to our country to serve our motherland.

INTERVIEW



Arun Vishram Gurav
BE Civil
SKYLINE INFRAMART

1.Tell me about your journey from a Civil Engineer to an Marvellous Enterprenur ?

Ans: I completed my B.E in Civil engineering in the year 1980. I always knew, that Civil is a field that will never cease to be in demand as it provides people witn basic needs that are always going to be required. Thus, it provides great opportunities in entrepreneurship. After a few works of working on construction sites, I decided to open a firm of my own. So I started my firm, Skyline Inframart . Since then we have successfully carried out a lot of projects. Thus I have completed 26 years in this field.

2.Tell me about your needs & expectation from the young Civil Engineers ?

Ans:Today's Engineers are more syllabus oriented,they are theoretically very much perfect,but when it comes to practical knowledge,most of the students lack it,may be due to lack of practical knowledge assigned by the Mumbai University student curriculum.From my past experience I have seen students with over 9 pointers but they lack technical knowledge also their presentation skills are horrific,which in turn will nullify the entire marks,on the other hand students with 7to 7.5 pointers have excellent technical knowledge also they have the best presentation skills,so as an enterprenuer I would choose the second as he is more industry ready and can interact with the students or the Enterpreneur.

3.What is the scope for the Enterprenurship in this generation ?

Ans:Enterprenurship is not about having scope or earning money,its about the passion and the skills which help to persue your dreams.Beiong an Enterprenur is never an easy job,right from setting up your own firm and investing money and then working with new employees,all these factors make it ver difficult job for a person to start a new firm also to compete with big companies requires a great coureage and also to it is very important to accept failuires and learn from it.As"FAILURES IS THE STEPPING STONE TO SUCCESS"

4.How important it is for students to bridge the gap between the industry and the students ?

Ans:It is very important to bridge those gap as the students needs that industry touch,which is only possible by conducting training programme and making the students well worshed with the currentb scenario of the industry.Industry meets varies from time to time and person to person so it is very important for the people to be a complete package as he should be overall skilled also the person should be good with the vocabulary skills as interacting with the people is the main key to be a successful enterprenur.

5.How can we inspire younger generation to take up Civil Engineering ?

Ans:As Civil Engineering is one of the core branches of the Engineering department,Also with the growing population there will be need for the accomodation for which Civil Engineers will be required,also jobs in government sector is open for Civil Engineers.There are also lots of monuments,public bridges,railway tracks and roads which needs to be maintained from time to time for which Civil Engineers will be required. Civil Engineers led the foundation in the society for the others to get established.So,I think Civil Engineering would be a better option for the new generation students.

BLOG



KETAN BELSARE
M.E(STRUCTURE)
ANMOL ASSOCIATES

India is a developing country and a lot of development needs to be carried out even in the field of construction.There are a lot of areas where improvement needs to be made.

We need to take utmost care during the construction process itself.So that we do not need to waste time and money for preparing procedure.Quality needs to be maintained. This also helps in avoiding accidents and saving many lives.

The quality of materials used in roads has to be improved. The roads are not being constructed properly.So we have to spend a lot of money in maintenance of roads.Also, it causes discomfort to the general public.The roads are rebuilt almost every year but still care is not taken while constructing them so

they are damaged.This cycle keeps continuing.The railways are a public transport used by a lot of people on a daily basis.But the train system is prevailing to be insufficient.The passengers are not safely accommodated, this has been causing incidents.

Slums exist even in sources of the most developed cities in India.The redevelopment of these areas has to be done or development is impossible.The government has started various schemes like the slums redevelopment scheme.But these activities need to be given impacting to accelerate redevelopment.

One of the major problems we are facing today is waste management.The waste is not being disposed properly. This happens due to lack of awareness in the general public and insufficient waste disposal facilities.The waste is hardly being segregated, which makes its disposal impossible.This leads to piles of waste getting accumulated.There are definitely ways to make things better and accelerate the progress. But it needs willingness and efforts to be put in nom outside.

It is not like that this problem can not be solved.There are definitely ways to make things better and accelerate the progress. But it needs willingness and efforts to be put in nom outside.

FACULTY WISDOM

E-waste The Unknown Poison

Mr. Khalid Sayed

The appliances and gadgets which run on electricity are known as Electronic Gadgets. In today's era of modernization, digitization many gadgets are in use which run on electricity. Today mobile phones, computers, refrigerators, microwave oven, laptops etc are used almost everywhere in the world. Wherever there is development ,these electronic gadgets are been used and they are a part of the development system.

From last two decades we are talking about water pollution, air pollution and very recently about noise pollution. There are other pollution which can be seen in the world and have emerged as a serious health problem. As we are on the path of development and when development is being done then there is generation of waste i.e. old products are discarded. Instead new products are placed. In replacement of electronic gadgets there is waste generation, known as electronic waste or E-

waste.
Now a days we see electronic gadgets are replaced so frequently. The reason for this are
1) Advance Quality of Product
2) New Features
3) Fashion etc.
Moreover it has become a trend now a days that the users get bored with the gadget they are using.
The users feel the gadgets are no more useful.
The very first problem with the E-waste is of its quantification. For quantification of E-waste life cycle analysis(LCA) of the gadget is necessary. For example people replace their mobile phones every year. In such case a person changes 10 mobile phones in 10 years. The old mobile phone comes out as a waste. Similarly, floppy drives were used earlier but now they are obsolete. All these floppies come out as a E-waste. We even do not see any floppy drives assembled in new computer sets. After the floppy, CD's came in the market followed by pendrive which made CD's useless. In this way the technological advancement in 3-4 years has been so good that the old product becomes useless. Now all these obsolete and useless gadgets comes out from the users home as waste and is known as E-waste. The total waste generation including the E - waste in

Mumbai is around 8000 metric tonne per day. Earlier it was dumped on the dumping ground. Now a days scientific treatment is being done to a certain limit. But there are many other small and big cities in our country which do not have such scientific treatment facilities. The waste is just dumped in the dumping ground which also contains E-waste.

The second problem with the E-waste is that it contains heavy metal, like lead, mercury, cadmium etc. Which are toxic to human beings. At dumping ground the moisture from the wet waste gathers and flows. The flowing concentrated moisture is of certain ph which is known as leachate. This leachate comes in contact with the electronic waste at the dumping ground and dissolve the heavy metal into it. The heavy metal leach out and mixes with the groundwater making in polluted i.e. hazardous(Toxic). The heavy metals leach out in the surrounding soil making the soil hazardous i.e. Toxic. It is seen that people in the small town burns this electronic waste. Burning of electronic waste gives out hazardous air pollutants like dioxins, furans etc. Studies have shown that dioxins, furans, PCB's are cariogenic to human being if inhaled in very less concentration.

In this way the E-waste becomes hazardous to human being by entering the ground water,soil and air.The ef-

fect of which are cancers, tumours, allergies etc. People leaving in these areas are unaware of the hazardous situation developing day by day.

To stop this problem developing further the manufacturer of the electronic waste ,the users of E-waste are need to be educated regarding E-waste hazards. There are guidelines formulated regarding E-waste. It is the responsibility of all the human beings to follow the guidelines, educate and spread awareness about E-waste hazard, so that the world become a healthy place to live on.

“Swach Bharat, Swasth Bharat”

Nuclear Ventilation

Mr. Anuj Pawar

Radioactive materials are hazardous to man due to the photos or the particles they emit, and some such materials are also chemically poisonous. Those emissions transfer their energy to the atoms and molecules in tissue and thereby damage it by destroying or altering vital parts of its structure.

Ventilation systems in radioactive facilities are almost always multifunctional. In first instance, they perform the conventional non-nuclear role of providing an acceptable working environment by controlling temperature and humidity. Secondly, they provide operator protection by maintaining the required depressions and flows in various areas of the facility.

At the same time by collecting the contaminated air flows they aid the airborne activity which could be released through the facility. This is known as contamination control, it can be achieved by means of physical

and dynamic barriers. The dynamic barriers are provided by ventilation systems with particular flow pattern and filters. Also negative pressure is maintained in ventilation area of nuclear facilities to avoid proliferation of air from radioactive areas.

The overall classification system employed for radioactive area must comply with the requirements of The Lonising Radiation Regulation (1991) and the associated Approved Code of Practice (L121) which introduce the concept of 'supervised' and 'controlled' areas. The purpose of this is to grade the operational requirements such as type of protective clothing, monitoring control access and to specify the design provisions needed to fulfil these requirements. This process is known as zoning.

Zoning is very important for nuclear building designing ventilation system for nuclear building. For zones are considered for nuclear ventilation viz red, amber, green, white.

Red zone is the cox area where radioactive contamination sources are present and no access is permitted. Influence of ventilation is very high in this area.

Amber zones are areas adjacent to red zones where there is a likelihood of contamination due to proximity to red areas.

Green zones are areas adjacent to amber zones where no radiation are present. Working without respiratory protection is permitted.
White zones is non-radioactive area where probability of contamination is very low and any person can access this area.
Hence different ventilation systems are required for different zone inside the plant.

Environment Issue

Mr. Vinod Salunkhe

A growing scale economic environment in India through the expansion of Infrastructure environment is constantly changing. So does the need to become increasingly aware of the problem that surrounds it with a massive influx of natural disaster, warming & cooling period. Different type of weather pattern and much more.

People need to attain type of problem our planet is facing. The global rising of temperature has become a dispute fact about life, our planet is warming up and we are part of that situation.

However, this isn't the only Environment problem that we should be concerned about. All across the world, people are facing the wrath of new & challenging environment problem. Some of them are

small & only affect a few eco-system but some are drastically changing the landscape of what we already know. Unless we address the various issue prudently and seriously we are surely doomed for a disaster.

SERVICE RESERVOIRS

Mr. Vinayak S. Bachal

Liquid storage tanks are considered essential life-line structures. Water tanks, in particular, are most important that must remain functional following disaster such as Earthquake. Most of the failures of large tanks after earthquakes are suspected to have resulted from the dynamic buckling caused by overturning moments of seismically induced liquid inertia and surface slosh waves. Recent earthquakes have shown that liquid storage tanks are found to be vulnerable to damage. This paper investigates the sloshing effect of water in water tanks when subjected to Earthquake forces. The analysis results obtained from the conventional method by considering the problem of water tank as Single degree of freedom system are compared with those obtained by considering the same problem as Two degree of freedom system. Also the variation of hydrodynamic

pressure on the wall and floor slab of tank container of ground supported tank corresponding to different water levels is shown. The comparison made, show a good agreement for the impact of slosh loads on tank wall as well as on the floor slab of the container in the cases investigated.

Indian Sub-continent is highly vulnerable to natural calamities/disasters like earthquake, draught, floods, cyclones etc. These natural calamities when occurred cause many casualties and property loss to a large extent.

According to seismic code IS: 1893(Part I): 2000 more than 60% of India is prone to earthquake. The property loss can be recovered to some extent after an earthquake but the loss of life cannot. The main reason for loss of life during an earthquake is the collapse of the structures. It is said that, it's the badly constructed structures that kill and not the earthquake. Thus it becomes important to analyze and design the structures to it's at most safet for earthquake effects.

Particularly talking about the water tanks, they forms the integral part of water supply system, which

is the life-line facility that must remain functional following disaster. These structures are used to store water, useful for drinking, fire fighting and domestic purpose. Hence these structures should remain functional even after the disaster to meet its purpose. These structures has large mass concentrated at the top of slender supporting structure hence these structure are especially vulnerable to horizontal forces due to earthquakes. All over the world, the elevated water tanks were collapsed or heavily damaged during the earthquakes because of unsuitable design of supporting system or wrong selection of supporting system and underestimated demand or overestimated strength. So, it is very important to select proper supporting system and also need to study the response of Elevated Water Tanks to dynamic forces to find out the design parameters for seismic analysis. It is also necessary to consider the sloshing effect on the wall and on roof slab of the container.

This sloshing of water considerably differ the parametric values used in design and economy of construction. The effect of hydrodynamic pressure on sides of container as well as base slab of container must be considered in the seismic analysis of Elevated Water tank.

High Level of Phosphates in Krishna River

Mr. Prashant R. Narayane

Rivers play an important role in human development and are an important finite natural resource. The physi-cochemicalcharacteristics of water determine to examine the water quality.The study of water quality involves a description of occurrence of various constituents in water and relation of these constituents to water use. The present study was undertaken to carry out a quality assessment on behalf of phosphates in surface water of Krishna River at Wai and to ascertain its suitability for domestic, industrial and agricultural purpose. The phosphates present in the Krishna river water in Wai taluka found to be higher than permissible limit and it is factor to blame for eutrophication.

Krishna River is one of the major perennial rivers, which drains three important States of South India. Wai is a town in Satara District, in Maharashtra state located on the Krishna River; Wai is located at 17.94°N 73.88°E,

approximately 35 km north of the city of Satara. India. Dhom Dam, west of Wai, was completed in 1982.The Krishna River flows through the Western Ghats at elevation of 1337m.

Krishna is Major River in Maharashtra, which is originated at Mahabaleshwar and travels 1400 kms till empties in Bay of Bengal. For Wai taluka particularly Krishna has a length of approximately 36 kms. The Wai is known as the city of temples “Dakshin Kashi”, there are more than 100 of temples situated in Wai. Wai taluka has seven ghats on the Krishna’s banks Gangapuri, Madhi Aali, Ganpati Aali, Dharmapuri,

Brahmanshahi, Ramdoh Aali and Bhimkund Aali and Menavali is 8th ghat which is 3-4 kms away from Wai. For the study purpose five points were selected on the river for collection of water samples.

STUDENTS CONTRIBUTION

Western Jetty

This paper proposes a water transport system for the western coast of Mumbai. This system proposes a 9 terminal water transport system which would utilise the existing beaches and modifying a part of the beaches to make terminals for the ferries and jetties. This system would reduce the traffic in the city as it will be capable of transporting vehicles and will reduce the mass movement pressure on the local western railways resulting in smooth transportation from north Mumbai to south Mumbai and will also boost employment as the fishermen can utilise their boats with slight modifications and would increase tourism .

Water transport is a cost-effective, relatively fuel-efficient, environmentally-friendly and employment-generating mode of transport. A number of countries are now taking initiatives to make better use of existing capacity of resources and invest in water transport. Keeping in view the city's configuration which offers the possibility of water transport to augment the existing transport capacity; Government of Maharashtra (GoM) has been endeavouring to develop a water transport system on the eastern and western coast of Mumbai. In continuation of its efforts, Maharashtra State Road Development Corporation (MSRDC) has been appointed as the implementing agency to implement the Water Transport System (Passenger + Ro-Ro) project along East Coast of Mumbai vide Government Resolution dated 6/3/2012. The Government has started implementing the water transport system on the eastern coast. In this paper we have proposed the water transport system for the western coast so as to reduce the load on Western Express Highway and Western Railway.

In this paper we'll be comparing some aspects of the Ferry Wharf-Eastern Coast Water Transport System with the proposed Western Jetty- Western Coast Water Transport System.

ABOUT PROJECT

The Proposed Western Jetty-Water Transport (Passenger and Ro-Ro services) System along the West Coast of Mumbai will connect Churchgate, Charni Road, Mumbai Central, Lower Parel, Dadar, Bandra, Vile Parle, Andheri (Versova), Malad, Bhayander,. The passenger water transport (PWT) terminals proposed are:

1) Nariman Point-Churchgate
2) Girgaon Chowpatty-Charni Road
3) Tardeo-Mumbai Central
4) Koliwada-Dadar
5) Pali Hill-Bandra
6) Juhu Beach-Vile Parle
7) Versova Beach-Andheri
8) Hamla Beach-Malad
9) Uttan Virgin Beach-Bhayander

Situated along the west coast of Mumbai. The estimated construction cost of the Western Jetty (Terminal & Elevated Approach road) project in comparison to the ferry wharf project which was approx. 76 crore per terminal is approximately INR 794 Crores.

-JAYKUMAR LODHA(BE CIVIL B)
SURAJ MISHRA (TE CIVIL A)

Human Power Harvesting

The present paper reviews different ways to overcome the issue of depletion of energy resources due to increasing human needs. World has become technologically advanced to very non-imaginable extent. The outcomes for most of the issues which never seemed determinable before a century has been resolved at this date. The study also reviews methodology and implementation of several means and devices for conversion of human energy to electrical resources. Civil engineering has evolved to a tremendous level in various aspects and constructing ways to build up human energy in efficient way is depicted in the following article The key purpose of this article to enlighten about how the human energy used in day to day life can helps to conserve and create electricity and how these ideas are easily executable with the help of smartphone apps, leading to a better future.

As the Newton's third law suggests that energy can neither be created nor be destroyed it can only pass on from one form to another. Human energy in the form of calories can be converted to kilowatts with the help of divergent devices for betterment of supply of electricity. By installing such devices in every buildings, educational, financial firms etc. a large amount of energy can be converted to electrical energy which will resolve the crisis of shortage of electricity.

BENEFITS:

- A huge amount of energy will be created with no cost and in this world of increasing demand for supply of energy human power is an absolute amazing source for the same.
- In gyms calories gets burned, as a result a person trying for the same will get benefitted in two ways i.e. he will burn calories and turn from fat to fit and alongside he will help in sustaining the energy and add on his contribution in protecting the environment.
- No electricity blackouts will be there and by installing such devices at rural places will lead to a great step towards progress.
- Formation of companies for constructing such buildings with all such devices installed will provide employment to many people.
- A positive use of wasted human power will be there and thus, will lead to minimal wastage of energy, not even a little amount of energy used for a single step will be wasted.

FUTURE SCOPE:

In future due to advancement in the field of DC motors and generators and IOT more advance apps efficient devices will be built with maximum efficiency and that day is not far when there will be no scarcity of electricity on this planet.

CONCLUSION:

- All in all, this paper provides invaluable research for the creation and efficient placement of energy harvesting devices. The first step of converting kinetic energy into power through momentum is already taken, where the simple act of being used probably produces enough power to keep these devices charged.

- Looking to the future, with advancements to kinetic energy harvesting, which follows the mechanism of kinetic energy being converted into power. With a population of billions of people on this planet , just with the help of few devices and smart phone application it is possible to generate huge amount of energy in day -to – day life which will lead to no crisis of electricity in the world.

-ROSHNI THAKUR
KOVID PRABHAKAR
(SE CIVIL B)

Nanotechnology

"Nano" in Nanotechnology suggests usage of something so small that it exists in the range of 10-9 to 10-11. Moreover the essential materials used in construction such as Cement, Steel and other composite materials have witnessed immense growth in the fields of strength, durability due to the application of nanotechnology. This in depth study about nanotechnology is all about creating a change at a nanoscale whichin turn causes a significant change at a macro level. Channelized and directive use of mainly carbon nanotubes, nanoparticles and TiO2(titanium dioxide) is highlighted in this study characterizing to the development of good quality concrete and steel, we would be mainly be concentrating on concrete and steel because they are known to be the most vital aspects of any construction.

NANOTECHNOLOGY AND CONCRETE

It will not be wrong if we call concrete the heart and soul of all are mighty structures. Both Construction and Nanotechnology not being new sciences, their collaboration was ignored for quite a while, but due to recent experiments and researches effective and manipulation has been done in the making and protection of concrete. Surfaces and the proportion of atoms at the surface and in the body center is far better than in the conventional cement silicate molecule, which suggest that the nanosilica molecules cover up a larger surface area which helps its structure to be more densely packed with comparatively lower void area, thereby increasing the overall strength of concrete.

PROTECTION OF CONCRETE

Other increasing concrete's strength at the ground level, Nanotechnology also plays a vital role in protecting or strengthening exist concrete. This is mainly done by fibresheet (matrix) made up of nanosilcate particles and hardeners. These nanoparticles penetrate and close small cracks on the concrete surface and, in strengthening applications, the matrices form a strong bond between the surface of the concrete and the fibre reinforcement. These sheets are impregnated upon the concrete by grooved rollers. These fabricated coating also act as galvanizing agents, which provide a barrier to corrosion..

EFFECTS OF NANOTECHNOLOGY ON THE ENVIRONMENT

Modification of Wood: In recent studies in nanotechnology revealed that wood is consisted carbon nanotubes like structures known as Nanofibrils, commonly known as Woody Tissues
which are twice as strong as steel, therefore as a result harvesting these nanofibrils would create materials possessing the structure wood and strength more than steel, thus an alternative for both wood and steel could be developed in turn reducing the amount of deforestation and also emission of harmful pollutants during formation of steel, leading to a decrease in the exploitation of the environment. The Fiber matrix coating and self-healing concrete both constrict a drastic production of new conventional concrete, due to which a complete series of pollutants is prevented from being emitted from the cement production process.

GREEN BUILDINGS: Nanotechnology from the start has been the root for this green building tree. The concept of an ideal "Green" Building is similar to any other building but just that environment in such kind of a building is conserved in every small aspect. With the help of Nanotechnology smog eating concrete is also brought into existence, which reduces the amount of smog in the surrounding atmosphere, which is ultimately a boon for both the human health and also the environment. Walls made of up of concrete derived from nanotechnology inhibit a property to provide insulation or air conditioning from the outside atmospheric temperature, thereby reducing external resources to provide for heating and air conditioning.

CONCLUSION

In reference to this paper we can come up to a conclusion that nanotechnology is a very unexploited field, which has capabilities to attain great heights but is held down due to its gravity of lack of awareness and knowledge at local levels. Although nanotechnology holds the future of our development and immense researches are taking place every day to figure out more efficient ways on implementing nanotechnology in civil engineering. Sooner or later we can expect our homes to be stronger than ever, surviving multiple disasters and most importantly supporting and protecting human life better than ever.

-VAIBHV P KARNIK,
RISHABH MADHANI,
ABHISHEK GURAV
(TE CIVIL A)

BASE ISOLATION SYSTEM

"EARTHQUAKES don't kill people,
COLLAPSING BUILDINGS do".

This is an old adage among structural engineers. Thus a huge moral responsibility lies on their shoulders as major risk of life and property is involved. There after many systems have been developed either to reduce the effect of earthquake forces acting on the structure or to absorb a part of the seismic energy. Base isolation is one of the most widely accepted and implemented seismic protection system.

Base isolation also known as seismic base isolation is one of the means of protecting a structure by decoupling a superstructure from its substructure resting on a ground by introducing a suspension system. It is generally introduced in earthquake prone areas.

The basic principle behind base isolation is that the response of the structure of a building is modified such that the ground below is capable of moving with transmitting minimal or no motion to the structure above by the means of suitable suspension systems.
Thus when a building is isolated from the ground, resting on flexible bearings or pads known as base isolators, it will move only a little or not at all during an earthquake thereby introducing flexibility in the structure.
The basic requirements of an isolation system are:

- Flexibility
- Damping
- Resistance to vertical loads

Types of base isolation devices are:

- Elastomeric Bearings
- High Damping Bearings
- Lead Rubber Bearings
- Flat Slider Bearings
- Curved Slider Bearings
- Ball and Roller Bearings

Materials used in base isolation are:

- Lead
- Rubber
- Steel

Base isolation structure is widely accepted for the structures around the globe. Tomb of Cyrus is said to be the oldest base isolated structure in the world.

Famous projects in the world using base isolation:

Minato Mirai 21, Japan
Asian Art Museum,USA
Utah State Capital,USA
Coronado Bay Bridge,USA
Los Angeles city hall,USA

There are more than 3000 seismically isolated structures in the world.The number not includes buildings but also bridges.Base isolation system is also incorporated in India.The completion of new earthquake resistant Bhuj District Hospital in India's earthquake prone Gujrat state is the first base isolated building.

Base Isolation method is globally accepted method has certain advantages as well as disadvantages.

The advantages of base isolation system are as follows:

1. Reduce the seismic demand of structure and thus reduces the cost of structure.
2. Less displacements of structures during an earthquake.
3. Improves safety of structures.
4. Preservation of important monuments.

The disadvantages of base isolation system are as follows:

5. Base Isolation is not suitable for structures resting on soft soils. It is adopted only for structures resting on hard soil.
6. It becomes less efficient for high rise buildings.
7. Implementation in efficient manner is difficult and often requires high skilled labors and engineers.

Base isolation has not only proved to be reliable method of earthquake resistant design but also has the effect of reducing earthquake effects nearly by 30%.The success of this method is largely attributed to the development of isolation devices and proper planning.

-MANALI GAWDE
(TE CIVIL A.)

TAIPEI TOWER.

TAIPEI tower is located in NANGING city in CHINA. In 2004, 509 meter tall tower is constructed. TAIPEI tower is the tallest tower in the china city. This is the best tower in its own because it is constructed in the worst conditions like high tide, Earthquake and the power full wind in 2004.

The design of the TAIPEI tower is made by the chines Architect C.P.Wang. According to Wang the design was given by the nature. He made design similar to the structure of BAMBOO. Bamboos are internally strong and it possess the property of elasticity, because of this the structure withstand the worst conditions. Bamboos contains the horizontal beam after certain height, similar to this TAIPEI tower also contains the horizontal trusses after certain height.

Talking about the elevator, TAIPEI tower has world's fastest elevator which is digitally control by the control room. Under 37 seconds it covers 84 floors. To slow down elevator here the Ceramic carbide is used because its efficiency increases with increase in temperature. Now talking about the damp ball it is actually located at 87th floor and its function is to make the tower stable in extreme wind. In actual when wind try to bend tower in right the damp ball oppose this wind force and make it stable by absorbing the energy. In short it uses the concept of inertia.

-JAY M. PRAJAPATI
(SE CIVIL B)

RERA: AN ACT

THE Real Estate (Regulation and Development) Act, 2016 or RERA ,finally notified and consumers all over applauded the step taken by the centre. The Real estate industry and poorly regulated business The enactment of this legislation was a statue can bring little adminicle to the consumers.

Highlighting The core of enacting this Act, the preface of this Act states," An Act to establish the Real Estate Regulatory Authority for regulation and promotion of the real estate sector and ensure sale of plot, apartment estate project, in an efficient and transparent manner and to protect the interest of consumers in the real estate sector and to establish an adjudicating mechanism for speedy disputes redressal and also to establish the appellate Tribunal to hear appeals from the appellate tribunal to hear appeals from the decisions, directions or orders of the decisions, directions,directions or orders of the Real Estate regulatory authority and the adjudicating officer and for matters connected there with or incidental there to"out of the 29 states, only 15 states have notified the state rules under the Act, while all the 7 union territories have notified A list of the states who have notified the states who have notified rules are here.

In addition to notifying the rules, the authority the rules, the authority and the tribunal also have to be set up, a fully working website has to be set up and developers & agents have to regis-

tered When the announcement cause initially, there was much joy in minds of the consumers as they thought that the government has finally heard their voices however, with the delay and dilution, the consumers feels cheated.

Roles and responsibilities:-

- Citizen Centricity & Transparency.
- Real Estate Project Registratoion.
- Financial discipline.
- Filling of complaints.
- Real Estate Agent Registration.

FOR BUYERS:-

- Buyer friendly Model contract
- Disclosure of Carpet Area must
- Consent of 2/3rd allottees for any change in the project plans.
- Applies to all on going projects without completion certificate.
- Penalty on builders same as penalty on buyers for payments delays.

FOR BUILDERS:-

- All projects details to the public
- Liable for structural defects for 5 years.
- Imprisonment for violations.
- 70% of sales income must for building and land cost.
- Real Estate Agents to register with RERA.
- Penalty includes project deregistration.
- Non-compliance with triabund order could mean jail.

Under the draft rules:-(Enclosure for registration)

1. Pan card.
2. Audited Balance sheet of preceding 3 years .
3. Number of open parking areas.
4. Development Agreement/Collaboration Agreement/Joint Development Agreement.

-SANTOSH GUPTA
(BE CIVIL B)

RISING TALENTS

BE IN SPORTS

NAME	SPORTS EVENT
ADINATH GITTE	BASKETBALL
ADINATH GITTE	VOLLEYBALL
PRATHAMESH DESHPANDE	FOOTBALL
PARTH DAGLI	FOOTBALL
RUSHABH MARU	FOOTBALL
KARAN PATEL	FOOTBALL
ROHAN KAKATI	ATHLETICS
KRUNAL PANCHAL	FOOTBALL
SAGAR SINGH	FOOTBALL
OMER KHAN	FOOTBALL
ABDUL	FOOTBALL
MANAV DAVE	FOOTBALL
KEVAL SHAH	FOOTBALL
AMIT DHAKA	FOOTBALL
AYUSH BHARADWAJ	FOOTBALL
SAMADHAN BANGHAR	CRICKET
PARTH DAGLI	CRICKET
RAJ GHOSH	BASKETBALL
CHETAN KOHLI	BASKETBALL
VISHAL MANJREKAR	BASKETBALL
SANJAY THAKUR	BASKETBALL
ANAND SINGH	BASKETBALL
SURESH MISHRA	CRICKET
SONU MISHRA	CRICKET
NITESH MISHRA	CRICKET
BELAL KHAN	CRICKET

BE IN CULTURAL EVENTS

NAME	EVENT
ASHWINI SINGH	DANCE
MONICA KORLEPARA	DANCE
MONICA KORLEPARA	FASHION
NIDHI SHAH	FASHION
NIDHI SHAH	DANCE
SHIVANI TAMBE	DANCE
RAJAT MISHRA	DANCE
DEEKSHA PATEL	DANCE

BE IN TECH/ART

NAME	EVENT
JAYKUMAR LODHA	BRIDGE DESIGNING
CHETAN KOLI	BRIDGE DESIGNING
MIHIR VOHRA	BRIDGE DESIGNING
SUPREET SAYAGAVI	TECH DEBATE & TECH PAPER PRESENTATION
MOHIT KARESIA	TECH DEBATE & TECH PAPER PRESENTATION
AJAY DWIVEDI	TECH PAPER PRESENTATION & JOURNAL
JAIDEEP PRABHU	TECH PAPER PRESENTATION & JOURNAL
MANIK MATTOO	TECH PAPER PRESENTATION & JOURNAL
SACHIN GUPTA	JOURNAL
ANKUR MANJARE	TECH PAPER PRESENTATION
MONICA KORLEPARA	JOURNAL
SHIVANI TAMBE	JOURNAL
HARSH MEHTA	TECH PAPER PRESENTATION & JOURNAL
TEJ PATEL	BOAT MAKING
MEET RAWAL	BOAT MAKING
DHAVAL AMLANI	QUIZ
HISTESH MISTRY	TECH PAPER PRESENTATION & JOURNAL
AJAY DWIVEDI	NPTEL
PRATHAMESH DESHPANDE	SKETCH ARTIST
MONICA KORLEPARA	SKETCH ARTIST
ROHAN KAKATI	SKETCH ARTIST
ADINATH GITTE	SKETCH ARTIST
PRAJKTA PUNWATKAR	SKETCH ARTIST

TE IN SPORTS

NAME	SPORTS EVENT
AJIT YADAV	INTER CRICKET
AKASH YADAV	INTER CRICKET
ADITYA SINGH	INTER CRICKET
YOGESH SHARMA	INTRA CRICKET
AATISH SINGH	INTRA CRICKET
ASHISH CHOUDHARY	INTRA CRICKET
SAURABH POKHARKAR	INTRA CRICKET
SALMAN ALI	INTRA CRICKET
SHASHANK PONGERKAR	INTRA CRICKET
SUNIL LODHI	INTRA CRICKET
KULDEEP DEVAL	INTRA CRICKET
SURESH MISHRA	INTRA CRICKET
SHASHANK PONGERKAR	INTRA FOOTBALL
DISHA MANA	VOLLEYBALL STATE LEVEL CHAMPION
RAHUL GUPTA	NFA GOA FOOTBALL WINNER
SHUBHAM RATHOD	WUSHU MARTIAL ARTS
SHUBHAM RATHOD	VOLLEYBALL ZONAL
ROHIT PARKAR	FOOTBALL ZONAL
ROHIT PARKAR	400 M RUNNER UP
ROHIT PARKAR	RELAY WINNER
SHUBHAM DHAWADE	KABBADI MATCH

TE IN CULTURAL EVENTS

NAME	EVENT
PRABLEEN KAUR BHOMRAH	INTRA DANCE
KRUPALI SHAH	INTRA DANCE
RAHUL SAVRATKAR	INTRA DANCE
SURBHI SAWANT	INTRA DANCE
VINAYA SAWANT	INTRA DANCE
PRABLEEN KAUR BHOMRA	VOCALS (COLLEGE BAND)
SHUBHAM WAGH	GUITAR (COLLEGE BAND)

SE IN SPORTS

NAME	EVENT
ROSHNI THAKUR	SKATING
VIKAS KUSHWAHA	TCHOUCK BALL
RISHAV JHA	FOOTABALL
AYUSH JHA	BOXING
SHUBHAM SINGH	CRICKET
VISHAL SINGH	ATHELETE
PARTH TAMBOLI	BASKET BALL
KEVAL SHAH	TABLE TENNIS
DEVENDRA SHARMA	FOOTBALL
KOVID PRABHAKAR	KARATE

SE IN SPORTS

NAME	EVENT
URJA PAWASKAR	PAINTING
PRANAY ZAWAR	KEYBOARD
PARTH TAMBOLI	DANCING

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Thank You

-The Editorial Team
E-MAARAT

Civil Engineering

