DEPARTMENT OF CIVIL ENGINEERING

Presents

KONSTRUCTZ

2020

VISION

Developing motivated, skilled and highly competent Civil Engineers to excel in Education, Research, Entrepreneurship and Technological services, so that the department as well as the Institute will be recognized high in a global scenario.

MISSION

To empower the students with broad and in-depth knowledge in Civil Engineering fundamentals and their applications in practical as well as professional fields to meet socio-economic challenges.

To educate the students in the latest technologies in Civil Engineering, imbibe in them human values, self-confidence, team work and independent thinking in solving diverse problems in the related field so that they can serve the society.

To achieve international recognition by developing professional Civil Engineers, offering continuing education and interacting with industries by emphasizing research and development.

From HOD's Desk…

I am glad that a departmental magazine "K-onstructz" has been published for all. I must appreciate all the students and the faculty members who worked tirelessly and within a tight time-frame to achieve this.

This magazine will serve as a platform for all the students of CE department to hone their skills in literacy, poetry, innovation and research ideas. The staff will contribute to make it more interesting in terms of emerging technologies and lateral developments.

I am sure it will be everyone's delight.

Prof. (Dr.) Tapas Sadhu

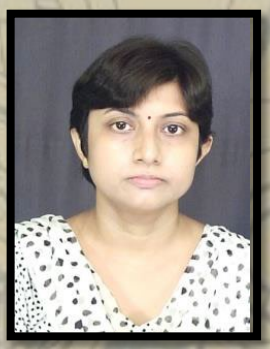
Head, Department of Civil Engineering.

SPECIAL MESSAGES FROM

Esteemed Faculty Members:

- Prof. (Dr.) Sarmila Sahoo

Departmental Coordinator



"I highly appreciate this initiative by our students for the first time. Our E-magazine K-ONSTRUCTZ publishes the research, development and ideas of technological advancement and encourages the creative side of our students. I do hope that they will continue with this. "

- ***Prof. (Dr.) Subhashankar Chowdhury***

"I would appreciate the students from our department for their enthusiasm …. You are the person who can change the world. You have a big responsibility to make the world better. I know you can do this very well. All the best to my dear student."

- ***Prof. Rudra Prasad Roychowdhury***

"I would like to express how delighted I am with the initiative taken by the students and professors in our department to compile and publish our E-magazine, K-onstructz. This magazine provides a platform for the students to showcase their knowledge of the advancements Civil Engineering is making as well as their talent in extra-curricular activities. Stay safe and wish you all the best for your future."

- *Prof. Prithwish Saha*

"Wishing all the members and students directly or indirectly associated with K-ONSTRUCTZ a grand success. Hope K-onstructz will create a revolutionary footprint towards the upgradation of Civil Engineering department of HIT-K"

- *Prof. Puja Basu Chaudhuri*

"I would appreciate the initiative taken by our Civil Engineering Department and especially which cannot be fulfilled without help of our beloved students. Thank you the team for your enormous effort. Hope we can publish many more e-magazines in future with help of you all. Best wishes……"

- *Prof. Chandrima Bhadra*

"I would highly acknowledge the students for this great initiative of publishing the departmental E magazine, K-ONSTRUCTZ . Also I would like to appreciate the innovative write-ups, poems, paintings and photos contributed by the students. Best wishes to all of you."

- *Prof. Saurav Kar*

"Certainly I would say this is one of the greatest initiatives taken by our department. I whole heartedly thank the total team of students and all the faculty members of our department……"

- *Prof. Bedshruti Sen*

"A great initiative from the students. This magazine would certainly enhance our technical knowledge and cover the aspects of recent development in civil Engineering. All the best for your future endeavor"

- *Prof. Rupam Sam*

"E magazine helps to access several important information very easily, regarding so many interesting topics to the readers in-depth and concise format. For Engineering students such magazine can also aware them with latest technological information which may also increase their interest towards the study. Therefore I really appreciate and encourage such initiative for E magazine by the members in the Department of Civil Engineering"

EDITOR'S MESSAGE

Dear Readers,

We hope that you all are doing well and are safe and staying indoors. We are sure you are bored of staying at home and want to rejoin college as soon as the COVID-19 pandemic ends. So to reduce your boredom we have been working on something that you would find very interesting. We are proud to present to you the E-Magazine "K-ONSTRUCTZ" 2020 of the Civil Engineering Department of Heritage Institute Of Technology.

We have had an amazing time while editing the contents that have been provided to us by our classmates, juniors, seniors as well as our honourable professors. We thank Prof. Saurav Kar without whose guidance it would have been impossible to edit and compile this magazine. This magazine is the representation of the talent that the Civil Engineering Department of Heritage Institute Of Technology has. Even the COVID-19 pandemic is not strong enough to stop the students of our department from showcasing their talent from home. This year's magazine not only contain contents related to technical aspects of Civil Engineering but also has poems, photography etc. which brings into light, that our department is also focused to bring the best out of the students in terms of co-curricular activities.

I am sure that you would enjoy reading the magazine. Any suggestion or criticism is most welcome.

Thanking You,

ARUNAVA GHOSH
(3rd year)

SOUHARDYA PATRA
(3rd year)

SOURAV SAHA
(3rd year)

CONTENTS

KINETIC FOOTFALL

(Power generation from footsteps)

Sourav Saha

(3rd Year)

Energy is very important in today's world. For example, we use different energy sources to generate the electricity we need for our homes, schools, businesses and factories. Electricity powers our TVs, computers, air conditioners, cell phones and washing machines - just to mention a few. We also use energy to run cars, planes, trains, buses and motorcycles. Energy harvesting also known as power harvesting or energy scavenging is the process by which energy is derived from external sources e.g. solar power, thermal energy, wind energy, salinity gradients ,and kinetic energy, captured, and stored for small, wireless autonomous devices, like those used in wearable electronics and wirelesssensor networks. Energy harvesters provide a very small amount of power for low energy electronics.

Walking is the most common activity in day to day life. When a person walks, he loses energy to the road surface in the form of impact, vibration, sound etc, due to the transfer of his weight on to the road surface, through foot falls on the ground during every step. This energy can be tapped and converted in the usable form such as in electrical form.

With that in mind investments are being made in the popular green energy sectors such as wind, solar, and wave energy. However, people's steps (thousands upon thousands a day) utilize and channel kinetic energy too.

Human body generates a lot of energy while doing the most-common activity - walking. Every foot fall causes pressure when the foot hits the floor, which goes untapped. With the ground surface engineered to harvest the energy, power can be generated from the human footfalls, stored and used as a power source or even fed to the power grid. For instance, a person dancing on an energy harvesting floor can generate 5-10 watts; in a packed dance club, the production can meet up to 60% of the total energy required for the club.

There are few methods to generate electrical energy from footsteps. Power would be generated by footsteps of crowd on the floor.

Footfall energy harvesting floor

An emerging startup called Pavegen has installed such squares of energy-generating pavement in London. In an effort to keep the production of the pavement as green and sustainable as possible, Pavegen partnered with Ryburn Rubber Limited and Advanced LEDs (which has also invested in the idea) to make sure that its components create as small an environmental impact as possible. The average square of pavement produces about 2.1 watts of electricity. And according to Pavegen, any one square of pavement in a high-foot traffic area can see 50,000 steps a day. Based on this data, only five units of Pavegen pavement can be enough to keep the lights on at a bus stop all night .

And while the power producing platform is over crowded with moving population, energy is produced at larger levels. Pavegen isn't targeting its product exclusively at municipalities. One of its big ideas is to have stores located on busy sidewalks install them in front of their locations to power their signage or any internal electronics. To encourage this adoption, the company says it will brand its slabs for its commercial customers. The slabs installed in East London happen to be green (thus suggesting its clean-tech solution) but they come in a variety of colours . The company believes the embedded lamp is important to inform passersby of their contribution to the clean energy movement.

An emerging technology in the industry is the footfall energy harvesting floor, which generates energy from the routine human activities, such as walking, running, jumping, dancing etc. The technology works on the basic principle of converting kinetic energy, obtained from the pressure applied on the floor surface, into electrical energy. The "footfall energy harvesting floor" comprises a floor covering that encloses a transducer mechanism for converting the applied pressure into electrical energy and a means for transmitting the electrical energy for storage or load consumption. Among the other technologies that promote sustainable energy, energy harvesting floor is considered to be the most productive as it does not depend on any of the natural resources, such as wind, water or sun that are not consistently available. Energy harvesting floors, which take input from human footsteps without affecting pedestrians' normal life, are easy to install, environment friendly, and are truly sustainable.

Experiments with energy harvesting floors

Researches and developers have experimented on footfall energy harvesting floors to study their feasibility, reliability and effectiveness. Constant experiments have been carried out in the East Japan railway stations, streets of Toulouse and West Ham

underground station over a period of varying durations, ranging from several weeks to few years. These experiments have provided evidences that energy harvesting tiles are robust, practical and can be used as an alternative source of producing energy. Post the initial success, improvements are being made and tested for enhanced power generation performance and capacity, along with advancements in material durability. The energy thus captured can be used to power streetlights, pedestrian crossing lights, bus stop displays, traffic signals, automatic ticket gates in stations, information displays etc. Dance clubs around the globe have piloted the footfall energy harvesting floors belonging to the prototype concept - "Crowd Farm", in which energy from footfalls of clubbers dancing on the floors is collected and used to power LED lights and, in the long-term plan, fed into the club's power grid.

Different technologies behind the energy floors

With this method energy harvesting proving its feasibility, developers of energy harvesting floors concentrating their efforts find the most-efficient way of harvesting energy from footfalls. To popularize and establish this technology among varied consumer segment, inventors have already initiated marketing of their products, which has been well received by environmental activists. Based on the mechanism used for converting the kinetic energy into electrical energy, footfall energy harvesting floors can be broadly classified into the following categories:

1) **PIEZOELECTRIC**- A piezoelectric element like PZT, PVDF etc is used as transducer means to convert the kinetic energy into electrical energy upon stepping on the floor tile. Deformation

of the piezoelectric element caused by the load acting on the tile induces charges which can be siphoned off.

2) **MAGNETIC-** Transducer means comprises a magnetic element and a conductive element wherein one of the element is movably coupled to the floor surface. When a pressure is applied on the floor surface, the conductive element cuts the magnetic flux and so current is induced in the conductive element.

3) **GENERATOR-** A mechanical arrangement viz. hydraulic, pneumatic and spring is coupled to the floor surface, such that a rotor of a micro-generator arranged in the floor tile is driven by the mechanical arrangement when a force acts on the floor surface.

4) **STATIC**- A capacitor is formed in the floor tile by using two charging layers uniformly separated by a small gap, wherein one layer is coupled to the tile surface through springs. By pressing the tile surface, the gap between the layers is altered and so charges are induced in the layers. These charges can be extracted by connecting the layers to an external circuit.

Future Aspects

In future aspects we can use this principal in the speed breakers at high ways where are rushes of the vehicles too much thus increase input torque and ultimate output of generator. If this project is implemented at very busy stairs palace then we produce efficient useful electrical for large purpose.

Advantages

- To store the electricity in battery.
- It can be use at any time when it necessary.
- Easy construction.
- Less number of parts required.
- Electricity can used for many purposes

Applications

- In street light.
- In LED light for specific purposes.
- In air circulation system for room by the small fans.
- For used in security alarm
- This can be implemented on railway station to generate electric power.
- In bus station.
- In car parking system.
- In Airports.
- In Lift system.
- In car lifting system.

- Electric escalators

CONCLUSION

In order to overcome the energy crisis problem and also contribute to create a healthy global environmental change, this technique need to be widely implemented. Thus this is a promising technology to provide efficient solution to power crisis to affordable extent. This will be the most acceptable means of providing power to the places that involves difficulties of transmission. Moreover walking across power producing platform will be a fun for idle people who can improve their health by exercising in such platforms with earning. The electrical energy generated at such farms will be useful for nearby applications. This technology would facilitate the future creation of new urban landscapes, athletic fields with a spectator area, music halls, theaters, nightclubs and a large gathering space for rallies, demonstrations and celebrations, railway stations, bus stands, subways, airports etc. like capable of harnessing human locomotion for electricity generation. Though being advantageous in several aspects, such as manufacturing, installation, aesthetics, maintenance, availability etc, this technology can only contribute to low power applications. It requires highly-efficient converter mechanism and storage devices and has a less storage lifespan. Besides, the materials used in manufacturing the devices must be highly durable, as they will be operating throughout the year. As of today, this technology is in its nascent stages due to the above stated reasons.

CLOUD COLLABORATION

Arunava Ghosh

(3rd year)

Construction work isn't just field work, there are teams of office and field workers using cloud based collaboration to complete projects. Cloud based collaboration in construction works to connect the field and office as well as general contractors with subcontractors. Cloud storage and software is no longer a new concept and has many benefits to it. One of these cloud collaboration tools is basestone. basestone is a system allowing the remote sharing of data on a construction site in real time. It is predominantly a review tool for civil engineers and architects which digitises the drawing review process on construction projects, and allows for better collaboration. The cloud-based collaboration tool is focused on the installation of everything from steel beams to light fittings. The system is used to add "snags", issues that happen during construction, on to pdfs, then users can mark or add notes through basestone. Trials have revealed possible cost-savings of around 60 per cent compared with traditional paper-based review methods. These benefits are some of the big reasons for using cloud base software and collaboration in construction.

Ease of Access

One of the benefits of cloud based software is the ease of access to files and information. Teams in the field and the office can easily collaborate on documents to stay up to date. This increases cloud based collaboration in construction since people can easily access documents. If there is a specific plan the foreman needs, they can easily find it. Since the document is in the cloud, they can search their project files from the field on their phone or tablet. While before, it would be dependent on whether the document was stored on the device.

Document Control

While it might seem out of place, the cloud based software offers easier document control. Now, people in the field and the office can have both access and editing rights to a document. If certain people aren't supposed to be able to edit it, an administrator can change the settings. However, if something needs to be modified in a field note or RFI, people both in the back office and in the field can make those changes. This is cloud based collaboration. Since the documents are saved in the cloud, it allows for access and editing to both parties.

Improved Communication

Cloud based collaboration also improves communication. Many systems allow for users to receive notifications or track who made edits last. Frequently users can also make comments on the documents themselves, or better yet send the document with

those comments. By submitting the document along in an email or another form of communication, typically the recipient opens up their copy and must send their copy back. While this ensures that everyone can work on the same text, it isn't the most effective, and it leaves a lot of room for error. By using cloud based communication and project sharing, it reduces errors.

One of the best benefits of cloud based collaboration is the ease of communication. Many platforms have ways of integrating communication into their system. So now emails and texts are available to see within project folders rather than just on a phone. One of the best benefits to this is verifying information. Having all of the communication in one place that can be accessed from other devices is one way to ensure that everyone knows what is happening. It also is an excellent way to verify information. If one person has emails stating one thing and someone has other information, they can see it and correct it.

Improved Check List

Cloud based collaboration is a great way to improve project checklists. Since many programs have systems in place to create checklists, using a cloud based collaboration system to share and update tasks is best. This ensures that everyone with access has real-time data. So the back office knows when a certain step on a project is complete even without a phone call. Once they can verify the information they can send out either payment or request payment to a vendor or the general contractor. This helps ensure that subcontractors are paid for the work on their list.

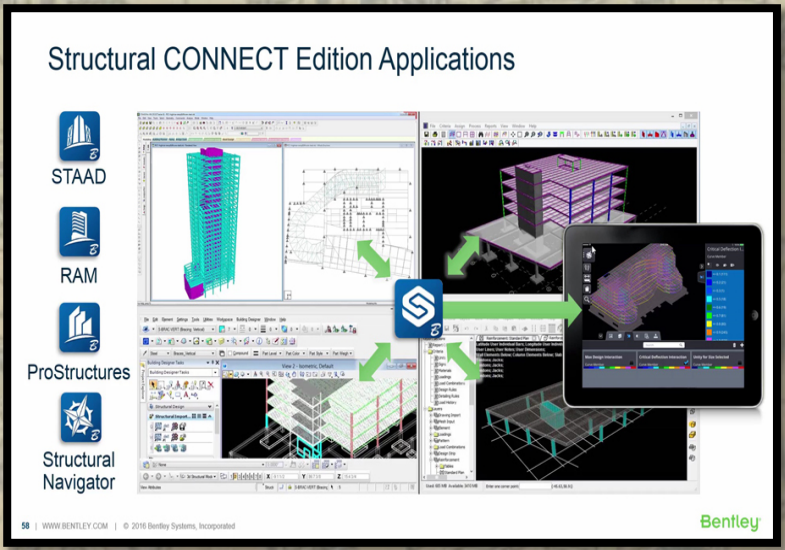
When the checklist is shared with the general contractor or project manager, they can suggest changes and verify steps. When they know the exact work a subcontractor is planning on doing, they can ensure that the scope is completely understood. It's also a good way to get confirmation on needed information. If a subcontractor's checklist now has a task for the general contractor they can see what is needed and complete it. Checklists and shared communication are two of the strong pillars and reasons for using cloud based collaboration. These reasons are especially strong in construction where communication is so incredibly crucial.

Eliminate Data Silos

Cloud based collaboration in construction is a way to eliminate silos between the back office and field, estimating and design, and everyone in between. Using a cloud based system ensures that documents are stored in one place. Having one storage location also increases the knowledge shared within one office. When the accounting and estimators can work with the most accurate drawings and designs they can ensure the most accurate estimates. Then the Foreman can see the drawings and budget they can make the best decisions based on their schedule. Then the subcontractor is connected to the designer or architect they have better tools.

Often times a design is submitted to the owner and general contractor in 3D but by the time the subcontractor receives it the design is now 2D. Designs are compressed into 2D drawings which don't always allow subcontractors the opportunity to verify their constructability. Subcontractors are the best people to determine whether the design can be worked. However, that is easier to determine based on the 3D and 2D models rather than just on the 2D models alone. By using cloud based collaboration, project managers, designers and general contractors can easily share

project files with subcontractors to ensure the most accurate information.



There are many reasons to consider using cloud based collaboration. Not only are these reasons compelling, but they are for the best of the construction industry. A recent McKinsey Institute study showed that one of the big issues facing construction is a lack of communication. The lack of communication and information withholding makes projects overall less efficient. 22% of companies surveyed found poor or old information to cause their rework. By increasing cloud based collaboration on projects many companies can see a decrease in the rework, delays, and other common issues in construction.

CIVIL ENGINEERING TODAY

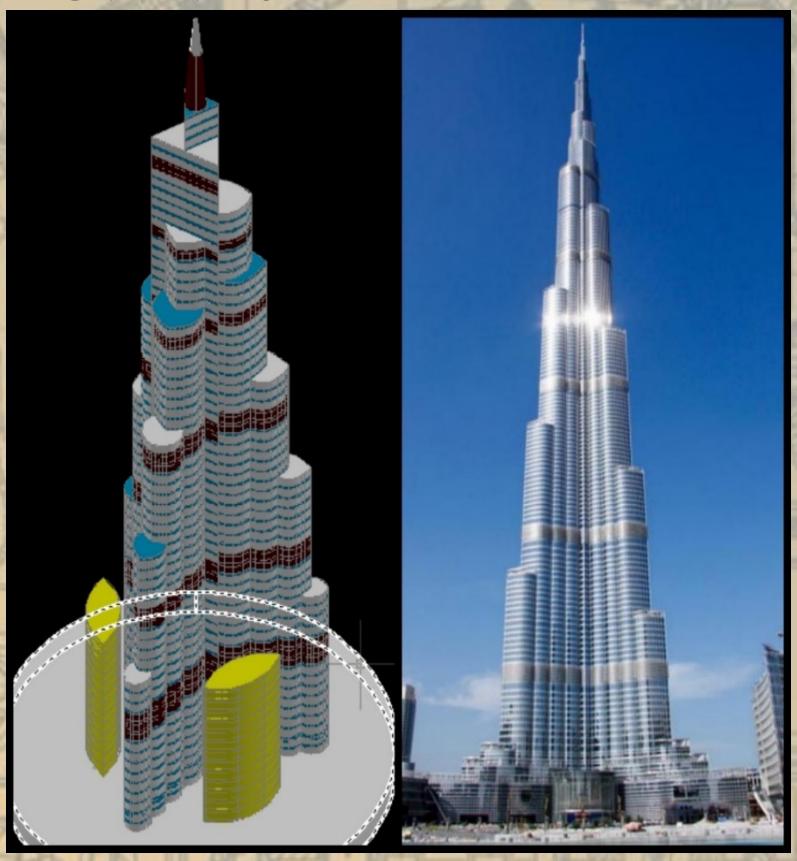
Brishti Bose

(1st Year)

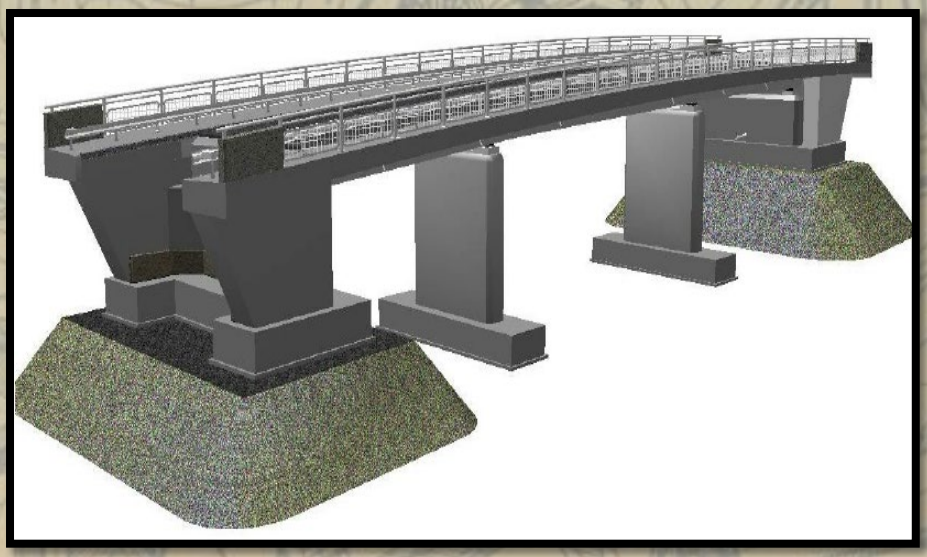
In the recent times, civil engineering saw a lot of scope in innovations and development. With increasing interference of technology and upcoming new projects, civil engineers could taste the new era of this field.

Virtual Reality is empowering the industry with an experience that was once possible only in science fiction. The interactive and immersive experience is being relished amongst the engineers, designers and workers by using VR headsets, cardboard viewers etc. Thus, it is giving a proper insight into the planned construction even before implementation.

Building Information Modeling (BIM) tops the list of latest innovations as engineers can now create virtual models of their designs through 3D modeling process. Construction of bridges, electricity networks and superstructures can gain workable virtual models. Thus, BIM is speeding up the time for building drawings, making it quite a cost-efficient process.



The development has not just taken place in the construction hub but also in the transportation business. The merging of transportation and technology is henceforth named as Intelligent Transportation System (ITS).



It aims to provide innovative services for different modes of transport and traffic management. The application of ITS is widely used and accepted in many countries. The use is not just limited to traffic congestion control, but also road safety and infrastructure usage. It has now become a multidisciplinary conjunctive field of work with many organisations developing ITS apps worldwide.

Civil Engineering has also paved it's way into one of the most booming industries amongst the youth; Start-up. With formation of apps, civil engineers are making the best use of technology to make things easier and earn a handsome profit. Civil Engineering,

Civilopedia, Basic of Construction Machine etc. are to name some. Apart from that, eBooks is also a zone civil is stepping in, hence proving the persistence of this industry in the World.

COMPLEX STRUCTURAL MODELLING

Souhardya Patra

(3rd year)

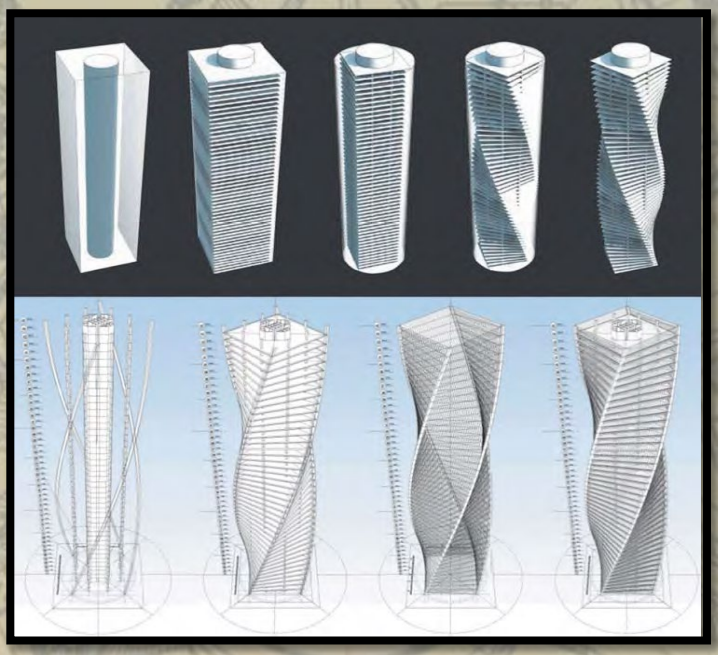
Structure of an object is like a skeleton of a human body. Hence, structure acts as a basic framework for any building. The robustness of any building immensely depends on its inner structure. Every day, various advanced technologies are getting introduced to the Structural Engineering Industry which helps in the construction of different types of modish buildings. Structural and Civil Engineering Industry is passing through a change cycle owing to various innovations in the way projects are executed.

Structural BIM Modeling Services facilitates modelers utilize different software to develop a precise 3D model. Before computer era began, engineers generally used paper for drafting or designing building structures. This posed as a great challenge to them. They often faced troubles in creating drawings with high accuracy. It made an easy way for modelers and engineers by providing enormous advantages over the restriction of paper and CAD drawings

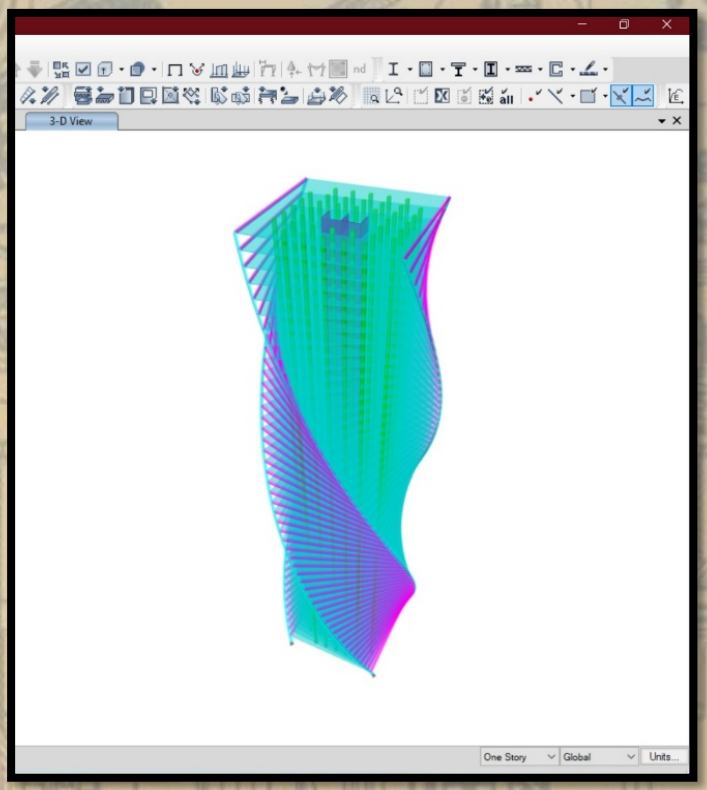
So, before designing our structure we need to model it in REVIT, ETABS, SAP2000 or Staad.Pro. Here are some of my modelling which have been done using fundamentals of civil engineering and application

Evolution tower

Evolution tower is located in Moscow, Russia and its height is around 246m from ground level. The complexity about its design is the Helicoidal nature starting from the center point of the skyscraper, each story rises up with a 3-degree twist, resulting in an elegant, clockwise spiral at more than 150-degree angle in total from floor to ceiling. The reason for this kind of shape in tall building is the wind pressure being minimized.



Here I have tried to model this tall structure in **ETABS** by only using basic tools.



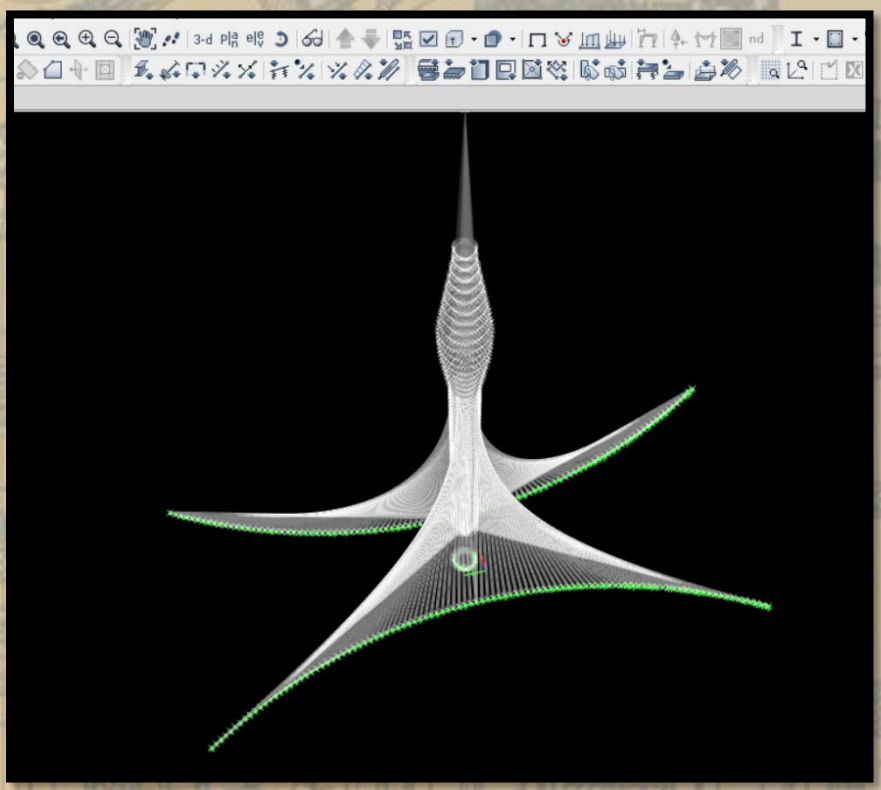
Creek Tower

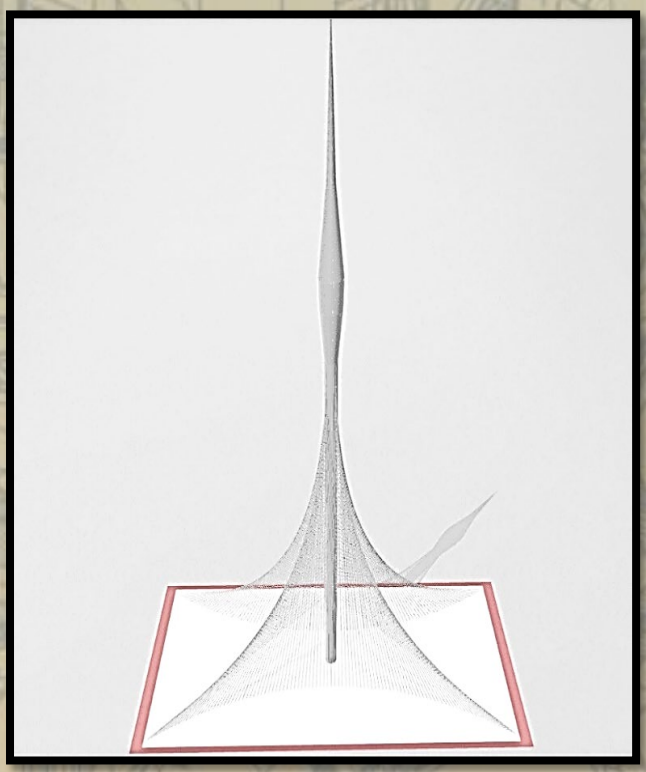
Dubai Creek Harbour Tower is expected to be 1345 metres tall it is loacted in Dubai, UAE. The construction started in 2016 and it will be completed before Expo 2020. Dubai Creek Tower building has 210 floors.

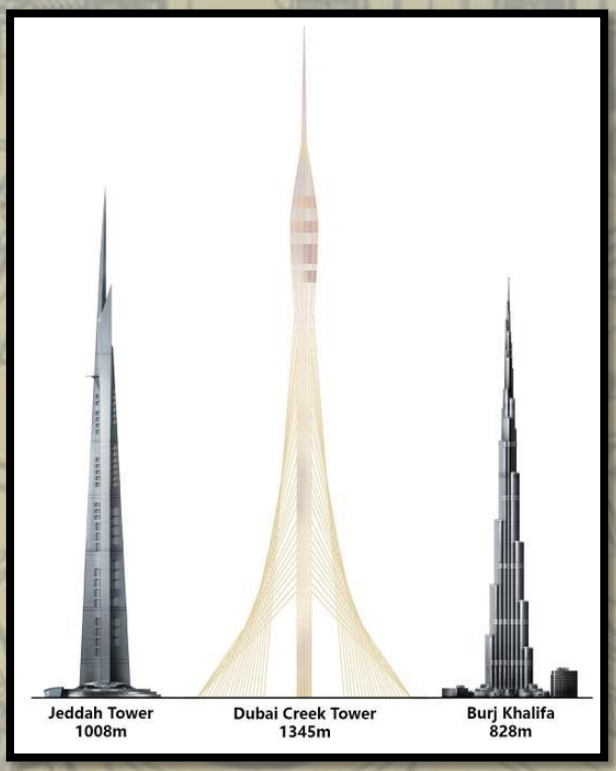
The Tower's design is inspired from the natural shape of a lily bud and takes the image of a minaret, a distinct feature of the Islamic culture. The central column is shaped in the form of a slender stem. A net of steel cables stays will anchor the reinforced concrete column to the ground and provide structural stability, and will be the longest ever used on a structure.

Damper systems and shock absorption systems will be placed at different locations and heights to improve the structural safety and stability. Comprehensive wind tunnel tests were completed in July 2016, establishing the structural stability of the tower.

Here the modelling has been done in **ETABS**, Later the rendering is done on **REVIT 2021**







Lotus Temple

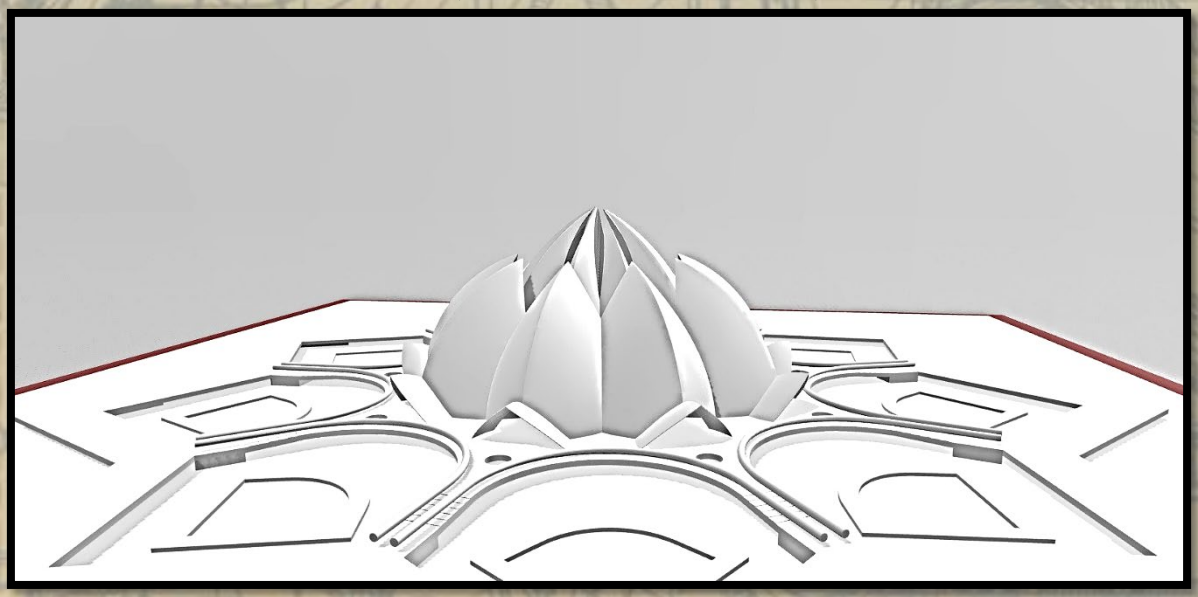
The Lotus Temple, located in Delhi, India, is a Bahá'í House of Worship that was dedicated in December 1986. The Lotus Temple has won numerous architectural awards and has been featured in many newspaper and magazine articles

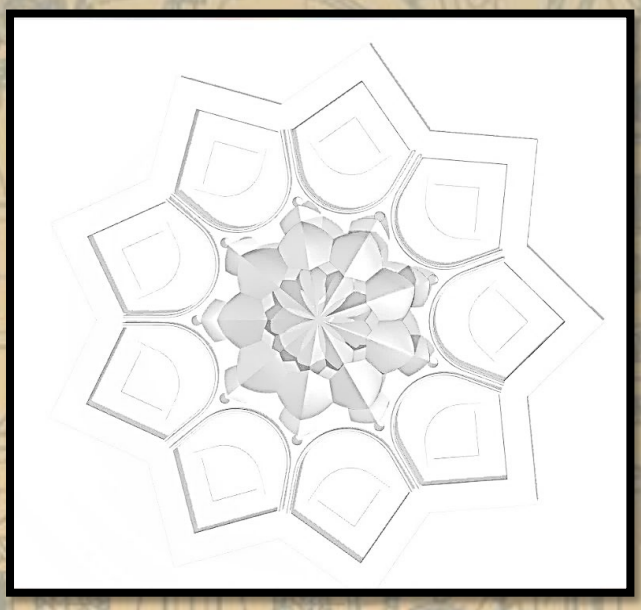
The structure is composed of three ranks of nine petals each, springing from a podium which elevates the building above the surrounding plain. The first two ranks curve inward, embracing the inner dome, while the third layer curves outward to form

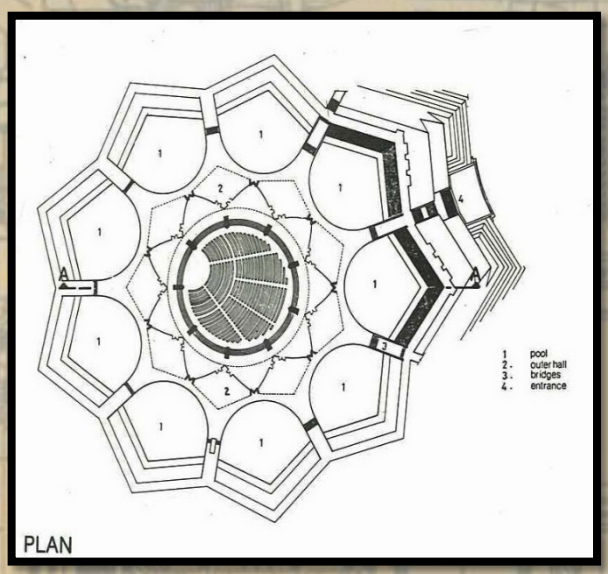
canopies over the nine entrances.

The central hall has a diameter of 34 metres and a height of 33.6 metres above the podium. The building embodies effective ventilation and cooling techniques. Fresh air, cooled as it passes over the fountains and pools, is drawn in through openings in the basement up into the central hall and expelled through a vent at the top of the structure.In original structure it is analysed by the programme called PLATE using Finite element analysis,

Here I have drawn the structure in **REVIT2021** and rendered it in **3ds MAX (Cover page photo)**







PILE FOUNDATIONS

BY: SOUMYADEEP GHOSH
2ND YEAR, SEC-B(CIVIL), ROLL-1858156

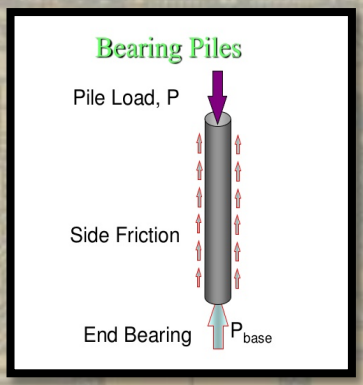
WHY PILE FOUNDATION IS NEEDED IN CIVIL ENGG. --

- Pile foundation is basically a type of deep foundation. It is used where foundation work is not possible by ordinary method of open pit excavation.
- This type of foundation is needed when very poor soil conditions extend to large depths and load to support is quite heavy.
- Pile foundations can be used for any type of structure and in any type of soil.

TYPES OF PILE FOUNDATION --

1. Acc. To function- BEARING PILES, FRICTION PILES, SHEET PILES, FENDER PILES, ANCHOR PILES, BATTER PILES, COMPACTION PILES.
2. Acc. To material- STEEL PILES, CEMENT CONCRETE PILES, TIMBER PILES, COMPOSITE PILES, SAND PILES.

MOST IMP. PILE FOUNDATIONS --



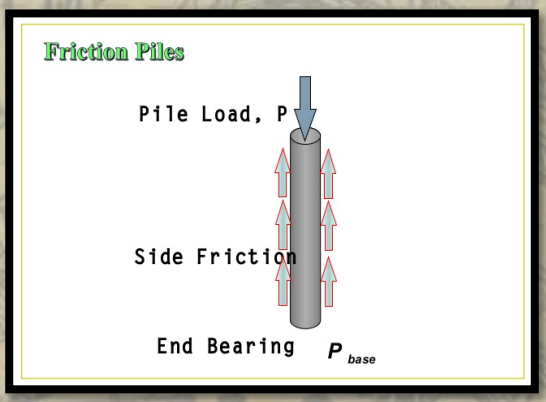
1.BEARING PILE •These piles are driven through the soft overlay soil and their bottom is made to rest on the hard structure or bed.

- The end of bearing piles act as vertical columns or piers.

- The soft soil through which the piles are driven , also provide lateral support to the piles and increase the bearing capacity of soil.

2.FRICTION PILE --

- When loose soil extends to a great depth, the piles are driven up to such a depth that the frictional resistance developed at the sides of the piles equals the load coming on the piles.
- Load carrying capacity can be increased by increasing the diameter of the pile.
- Economical.

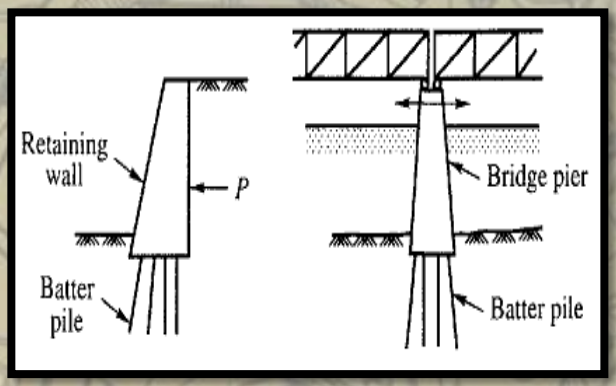


3. SHEET PILES --

- These piles are used as a impervious cut off sheet to reduce seepage and uplift under hydraulic structure.

4. BATTER PILE --

These piles are used to resist large horizontal or inclined forces.



5. CEMENT CONCRETE PILE

- Cement concrete is such a material which has very high compressive strength.
- Piles constructed with combination of cement concrete and steel rods , i.e., R.C.C. ,have become very popular and hence are in extensive use these days.

- These piles should always be understood as R.C.C. piles.

- These piles generally circular, square, or octagonal in shape.
- The diameter of these piles varies from 380mm to 640mm and their lengths from 4m to as much as 30m.
- These piles are always provided with reinforcement.

6.PRECAST CONCRETE PILES

- A steel shoe is provided at the toe of the pile and is secured in such a way that it becomes a part of the pile. It protects the toe of the pile.

CONCLUSION

Piles are often used because adequate bearing capacity cannot be found at shallow enough depths to support the structural loads. It is important to understand that piles get support from both end bearing and skin friction. The proportion of carrying capacity generated by either end bearing or skin friction depends on the soil conditions. Piles can be used to support different types of structural loads.

We shape our buildings,
thereafter they shape us.

Winston Churchill

BACTERIAL CONCRETE

Ved Prakash

(2nd year)

Introduction

In modern days, the use of technology has taken the standards of construction to a new high level. Different types of procedures, methods and materials are used to attain a very good, sustainable and economic concrete construction.

But due to human mistakes, incorrect handling and unskilled labors. An efficient building is hard to sustain its designed life. Many problems like weathering, cracks, leaks and bending etc., arises after the construction.

To overcome this types of problems, many remedial procedures are undertaken before and after the construction.

The common problem found in buildings is Crack. Crack may be due to many reasons. Some reasons are listed below,

- Concrete expands and shrinks due to temperature differences
- Settlement of structure
- Due to heavy load applied
- Due to loss of water from concrete surface shrinkage occurs

- Insufficient vibration at the time of laying the concrete
- Improper cover provided during concreting
- High water cement ratio to make the concrete workable
- Due to corrosion of reinforcement steel
- Many mixtures with rapid setting and strength gain performance have an increased shrinkage potential.

Bacterial Concrete or Self-Healing Concrete

This common problem of cracking in building has many remedies before and after the crack. One of the remedial process is **Bacterial Concrete** or **Self-Healing Concrete.**

The process of self-healing of cracks or self-filling up of cracks by the help of bacterial reaction in the concrete after hardening is known as Self-Healing Concrete.

It can be observed that small cracks that occur in a structure of width in the range of 0.05 to 0.1mm gets completely sealed in repetitive dry and wet cycles. The mechanism of this autogenously healing is, the width of range 0.05-0.1mm act as capillary and the water particles seep through the cracks. These water particles hydrate the non or partial reacted cement and the cement expands, which in turn fills the crack.

But when the cracks are of greater width, need of other remedial work is required. One possible technique is currently being investigated and developed was based on application of mineral producing bacteria in concrete.

The bacteria used for self-healing of cracks are acid producing bacteria. These types of bacteria can be in dormant cell and be

viable for over 200 years under dry conditions. These bacteria acts as a catalyst in the cracks healing process.

Various Types of Bacteria Used in Concrete

There are various types of bacteria were used in bacterial concrete construction are:

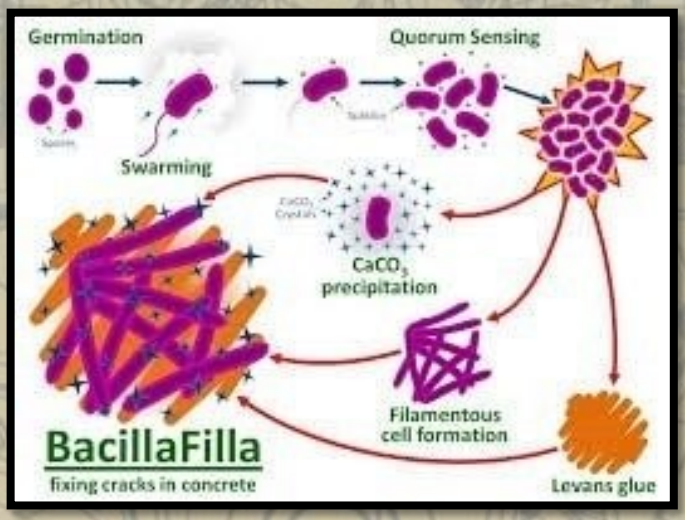
- Bacillus pasteurizing
- Bacillus sphaericus
- Escherichia coli
- Bacillus subtilis
- Bacillus cohnii
- Bacillus balodurans
- Bacillus pseudofirmus

Mechanism of Bacterial Concrete

Self-healing concrete is a result of biological reaction of non-reacted limestone and a calcium based nutrient with the help of bacteria to heal the cracks appeared on the building.

Special type of bacteria's known as **Bacillus** are used along with calcium nutrient known as **Calcium Lactate.** While preparation of concrete, this products are added in the wet concrete when the mixing is done. This bacteria's can be in dormant stage for around 200 years.

When the cracks appear in the concrete, the water seeps in the cracks. The spores of the bacteria germinate and starts feeding on the calcium lactate consuming oxygen. The soluble calcium lactate is converted to insoluble limestone. The insoluble limestone starts to harden. Thus filling the crack, automatically without any external aide.



The other advantage of this process is, as the oxygen is consumed by the bacteria to convert calcium into limestone, it helps in the prevention of corrosion of steel due to cracks. This improves the durability of steel reinforced concrete construction.

Fig: Process of fixing crack in concrete

Preparation of Bacterial Concrete

Bacterial concrete can be prepared in two ways,

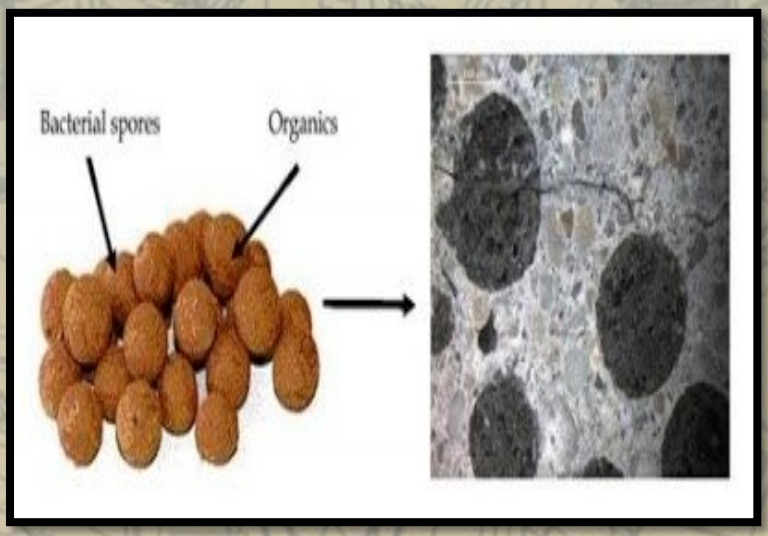
- By direct application
- By encapsulation in lightweight concrete

In the direct application method, bacterial spores and calcium lactate is added into concrete directly when mixing of concrete is done. The use of this bacteria and calcium lactate doesn't change the normal properties of concrete. When cracks are occurred in the structure due to obvious reasons.

The bacteria are exposed to climatic changes. When water comes in contact with this bacteria, they germinate and feed on calcium lactate and produces limestone. Thus sealing the cracks.

By encapsulation method the bacteria and its food i.e. calcium lactate, are placed inside treated clay pellets and concrete is prepared. About 6% of the clay pellets are added for making bacterial concrete.

When concrete structures are made with bacterial concrete, when the crack occurs in the structure and clay pellets are broken



and the bacteria germinate and eat down the calcium lactate and produce limestone, which hardens and thus sealing the crack. Minor cracks about 0.5mm width can be treated by using bacterial concrete.

Among these two methods encapsulation method is commonly used, even though it's costlier than direct application.

Chemical Process of Self-Healing or Bacterial Concrete

When the water comes in contact with the unhydrated calcium in the concrete, calcium hydroxide is produced by the help of bacteria, which acts as a catalyst. This calcium hydroxide reacts with atmospheric carbon dioxide and forms limestone and water. This extra water molecule keeps the reaction going.

$$CaO + H_2O \rightarrow Ca(OH)_2$$

$$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$$

The limestone then hardens itself and seals the cracks in the concrete.

Test and Result of Self-Healing or Bacterial Concrete and Normal Concrete

Standard test were conducted on normal concrete and self-healing concrete. Test conducted were Compressive and flexural strength tests on a concrete cube for 7 and 28 days.

SL NO	DAYS	NORMAL CONCRETE (N/mm^2)	BACTERIAL CONCRETE (N/mm^2)	NORMAL CONCRETE (N/mm^2)	BACTERIAL CONCRETE (N/mm^2)
1	7	20.85	27.10	3.90	4.6
2	28	30.00	38.95	7.05	7.80

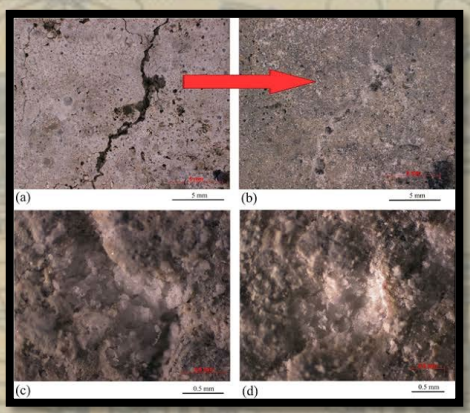
Compressive Strength Test result for 7 and 28 days for Bacterial Concrete and

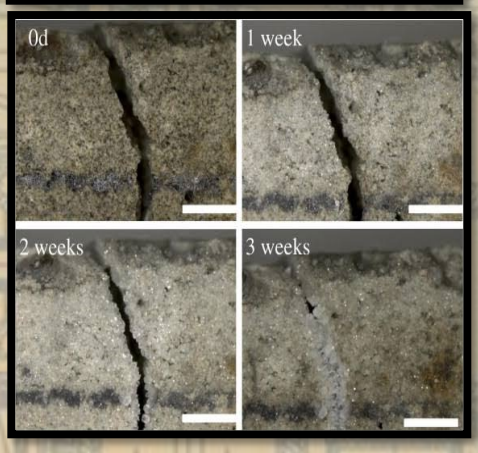
Flexural Strength Test result for 7 and 28 days of Bacterial Concrete

From the results we can see that both the compression strength and the flexural strength of the bacterial concrete is greater than that of normal concrete.

Advantages of Bacterial Concrete

- Self-repairing of cracks without any external aide.
- Significant increase in compressive strength and flexural strength when compared to normal concrete.
- Resistance towards freeze-thaw attacks.Reduction in permeability of concrete.
- Reduces the corrosion of steel due to the cracks formation and improves the durability of steel reinforced concrete.





- Bacillus bacteria are harmless to human life and hence it can be used effectively.

Disadvantages of Bacterial Concrete

- Cost of bacterial concrete is double than conventional concrete.
- Growth of bacteria is not good in any atmosphere and media.
- The clay pellets holding the self-healing agent comprise 20% of the volume of the concrete. This may become a shear zone or fault zone in the concrete.
- Design of mix concrete with bacteria here is not available any IS code or other code.
- Investigation of calcite precipitate is costly.

SOIL NAILING

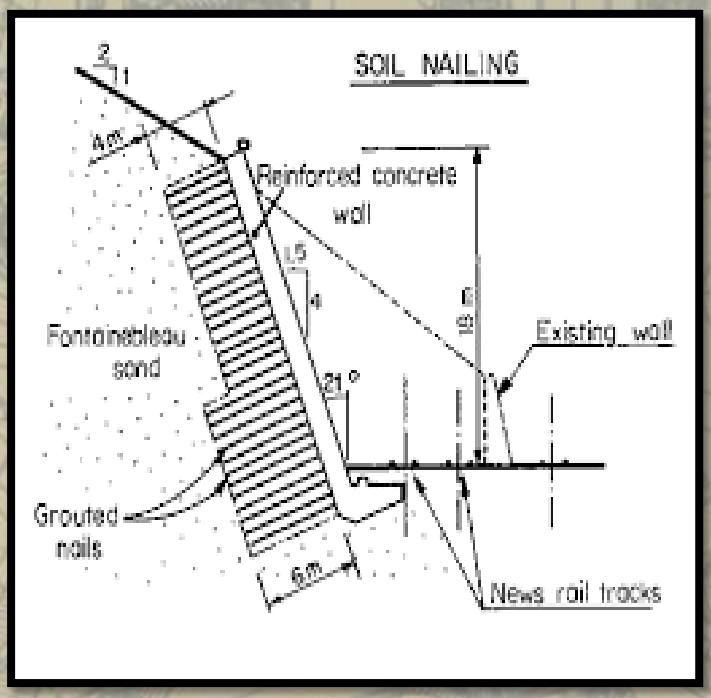
Moumita Debnath

(3rd Year)

Soil nailing is a ground stabilization technique that can be used on either natural or excavated slops. It involves drilling holes for steel bars to be inserted into a slope face which are grouted in place. Mesh is attached to the bar ends to hold the slope face in position. They are commonly used as a remedial measure to stabilise embankments.

Applications of soil nailing are given below:

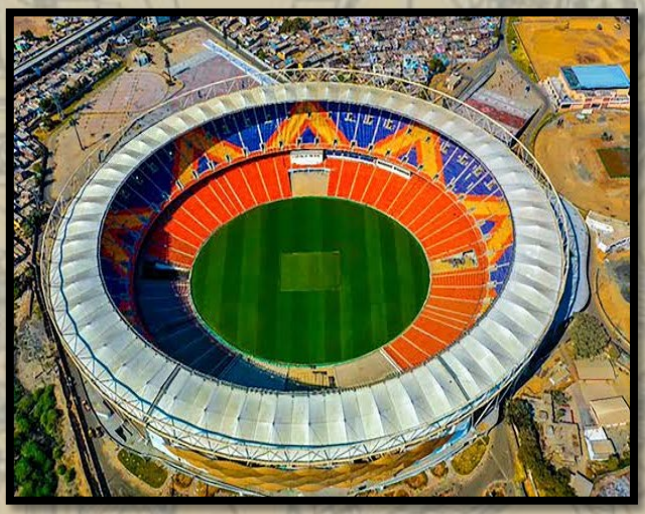
1. Temporary excavation shorting
2. Tunnel portals
3. Roadway cuts
4. Under bridge abutments
5. Repair and reconstruction of existing structure.



SARDAR PATEL STADIUM

Shivam Shandilya

(1st Year)



The Sardar Patel Stadium (Motera stadium) is a gigantic cricket stadium in Motera, Ahmedabad, India. It is named after Sardar Vallabhbhai Patel, India's first home minister who played a key role in ensuring India's territorial unity and sovereignty. It is the world's largest cricket stadium with a seating capacity of 1.10 lakh spectators overtaking the Melbourne cricket ground (MCG), Australia whose seating capacity is 90K. It is situated on the banks of the Sabarmati river at Motera in the outskirts of Ahmedabad.

The stadium was established in 1982 and underwent several renovations. In 2015, the stadium was closed and a complete reconstruction ha been done by 2020. The stadium is spread across 63 acres of land, with three entry points with a metro line at one of the entry points. A unique feature of the stadium is the LED lights on the roof instead of the usual floodlights at cricket grounds. This is the first type of lightning system for a stadium in India. It's roof has been made light weight and separate from the seating bowls. This allows for movement in times of seismic activity. It makes the stadium fairly earthquake resistant. The structure eliminates the need for pillars, which gives the spectators an unobstructed view of the entire field from any place in the stadium.

The idea to make the new stadium was proposed by Shri Narendra Modi , then president of the Gujarat cricket association and the chief minister of Gujarat. After starting the demolition work at the end of 2015, the Gujarat cricket association issued a tender notice on January 1,2016 in The Times of India and The Indian Express. Larson and Toubro (L&T) finally took over the construction work of the stadium in December, 2016 . The stadium was planned to get ready in 2 years and the reconstruction project estimated to cost around Rs.7 billion. However, the final cost has been reported at Rs.8 billion. Populous offered the master plan, architecture and interior design services for the project. Walter P. Moore served as the structural engineer for Motera's roof system. The stadium design shows the lower level of the ground for smaller events, which will help maintain the crowd atmosphere despite the colossal stadium not being full. Motera metro station project will be completed after September, 2020 for 'skywalk' allowing the crowd to directly enter the stadium within 300 metres from disembarking at the metro station. Motera stadium which is yet to be inaugurated, hosted the iconic event addressing U.S. president Donald Trump, “ Namaste Trump” on February 24, 2020. The stadium has 76 air-conditioned corporate boxes with a seating capacity of 25 each, an Olympic-size swimming pool and four dressing rooms, a parking area that can accommodate around 3000 cars and 10,000 two-wheelers. The stadium also has a club house with 55 rooms , gymnasium, indoor practice pitches and food courts.

SELF HEALING CONCRETE

Suman Sadhukhan

(2nd Year)

Cement is the main material for construction of any structure like Bridges, Buildings etc. But after the constructing structures loose their strength due to Deteriorating of concrete . For this reason the structures are compassed.

We know concrete generally have two types of forces TENSILE , COMPRESSIVE. Concrete can withstand compressive forces very well but not tensile forces. But when it's subjected to tensile force it starts crake. Those points are very much important for any structure . When the cracks are come in the structures its is lightly taken for small structures but in case of large structures like industry or pire of a bridges crakes are very dangerous its not negotiable like small structures.

Since 2006, Henk Jonkersa microbiologist and professor at Delft University of Technology in the Netherlands. Jonkers began developing self healing concrete.

Self Healing Concrete is basically bacteria based concrete.Self-healing concrete could solve the problem of concrete structures deteriorating well before the end of their service life. Concrete is still one of the main materials used in the construction industry, from the foundation of buildings to the structure of bridges an underground parking lots. Traditional concrete has a flaw, it tends to crack when subjected to tension.A healing agent is inject in the concrete to heal the cracks safely. A bacteria work like bacteria embedded in the concrete convert nutrients into limestone. It was tested on 2011 (Full -Scale Testing) . Every structure Should have a Expire date.But the tension characteristics of the concrete some structures are loss its strength.

- The Bacterial Concrete should not gave infinite life but it should increase the time limit of the ending.

These self-healing agents can lie dormant within the concrete for up to 200 years.

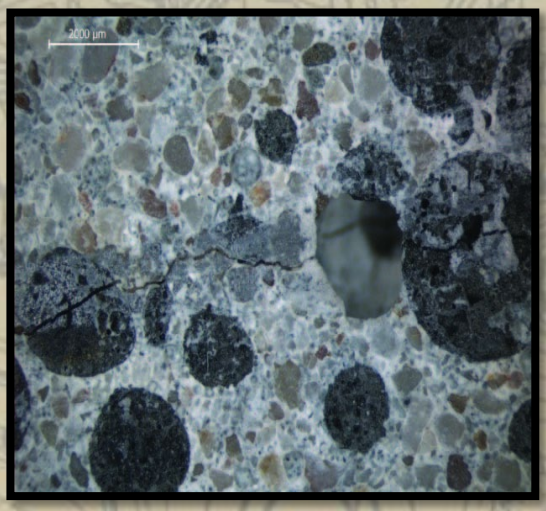
- its doesn't give same strength like before crakes.
- it resist the crake.
- This bacteria doesn't heal vertical crakes and large crakes properly as like horizontal crakes , small failure crakes.

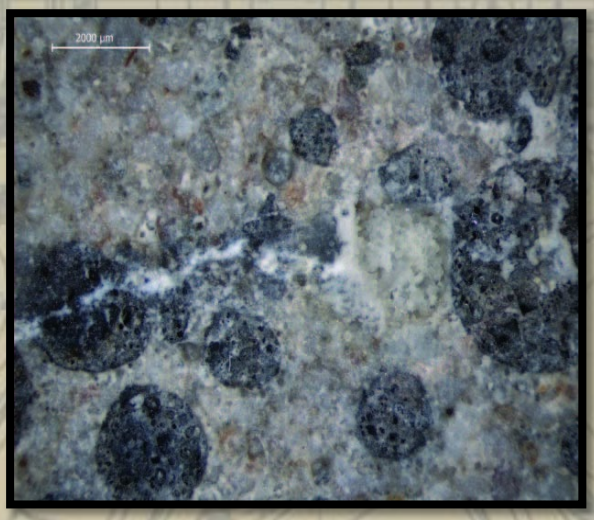
- Its not eco nomical.
- the clay pellets holding the self healing agent comprise 20% of the volume of the concrete.

The bacteria concrete or Self Healing concrete is in under research.This concrete is also known as 'BIOCONCRETE'.

Work of Bacterial or Bio or Self Healing concrete:

However, when a concrete structure is damaged and water starts to seep through the cracks that appear in the concrete, the spores of the bacteria germinate on contact with the water and nutrients. Having been activated, the bacteria start to feed on the calcium lactate. As the bacteria feeds oxygen is consumed and the soluble calcium lactate is converted to insoluble limestone. The limestone solidifies on the cracked surface, thereby sealing it up.





It mimics the process by which bone fractures in the human body are naturally healed by osteoblast cells that mineralise to re-form the bone.

The consumption of oxygen during the bacterial conversion of calcium lactate to limestone has an additional advantage. Oxygen is an essential element in the process of corrosion of steel and when the bacterial activity has consumed it all it increases the durability of steel reinforced concrete.

DEVELOPMENT IN ROAD CONSTRUCTION

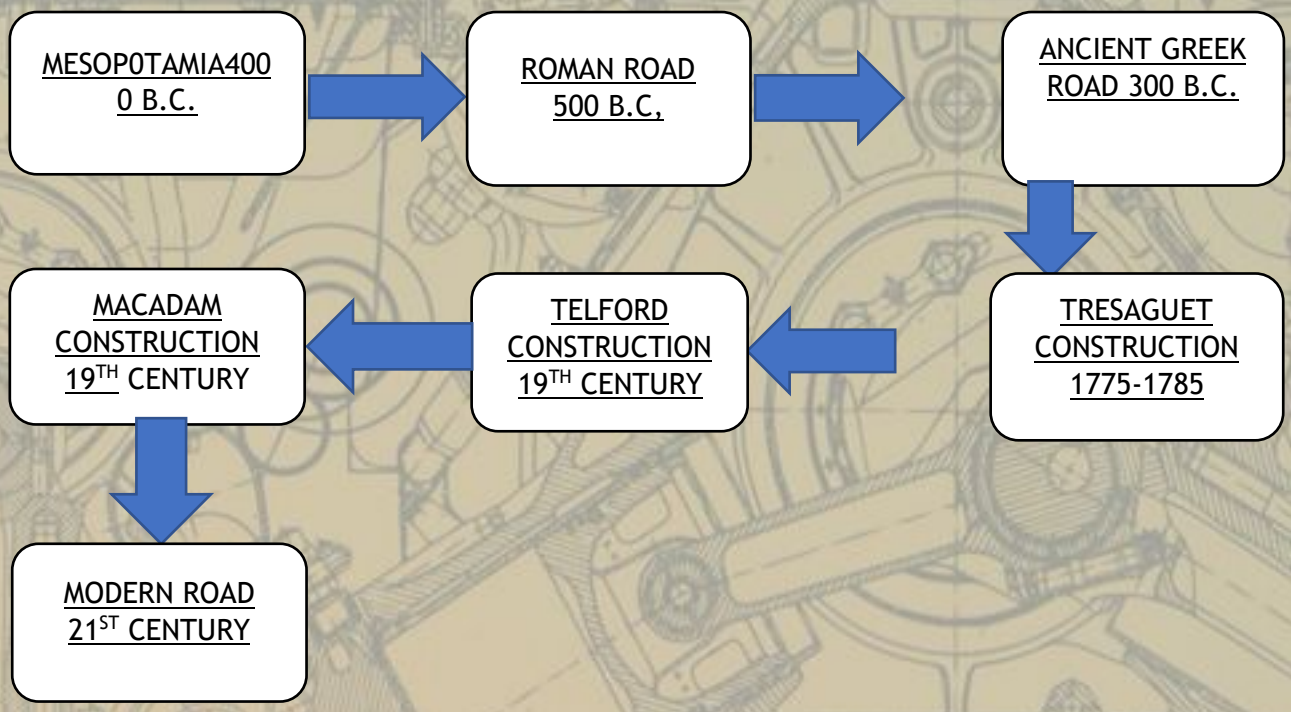
Arghadeep Banerjee

(3rd Year)

INTRODUCTION

- Road is a common and popular mode of transportation for a very long period after the invention of wheel.
- By the help of road transportation the passengers and the goods can be transported in one place to another.

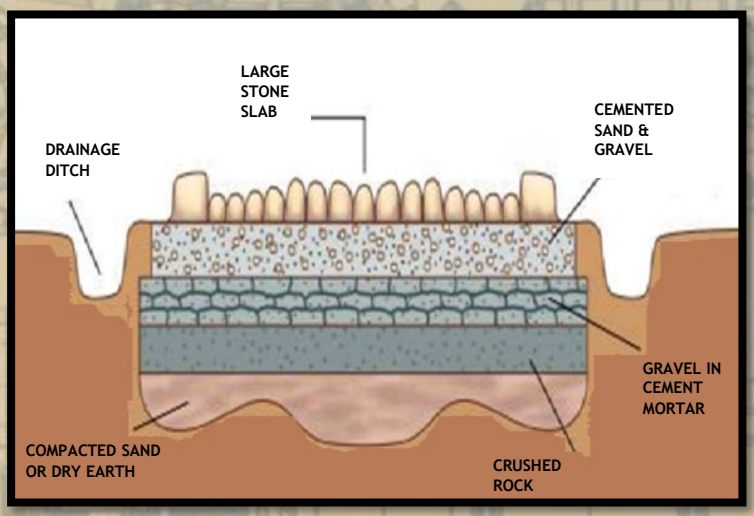
DEVELOPMENT OF ROAD AT A GLANCE



TRESAGUET METHOD OF CONSTRUCTION

The main feature of Tresaguet proposal was that the thickness of construction need to be only in the order of 30cm.

Another feature is Sub grade moisture condition and drainage of Surface water.

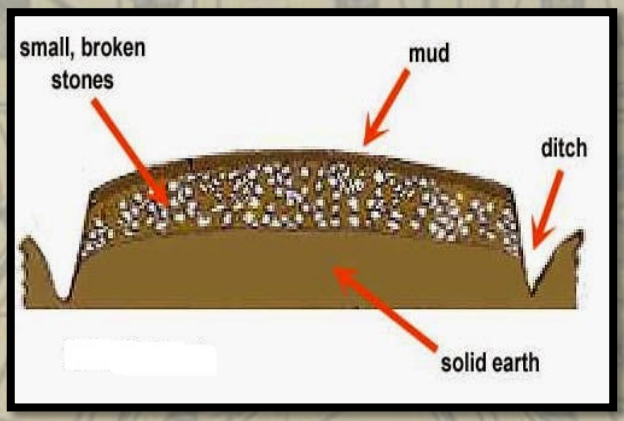


CROSS-SECTION OF TRESAGUET ROAD

TELFORD METHOD OF CONSTRUCTION

Providing a definite cross slope for top surface of the pavement by varying the thickness of foundation stones.

Sub grade is kept horizontal and hence sub grade drainage was not proper.



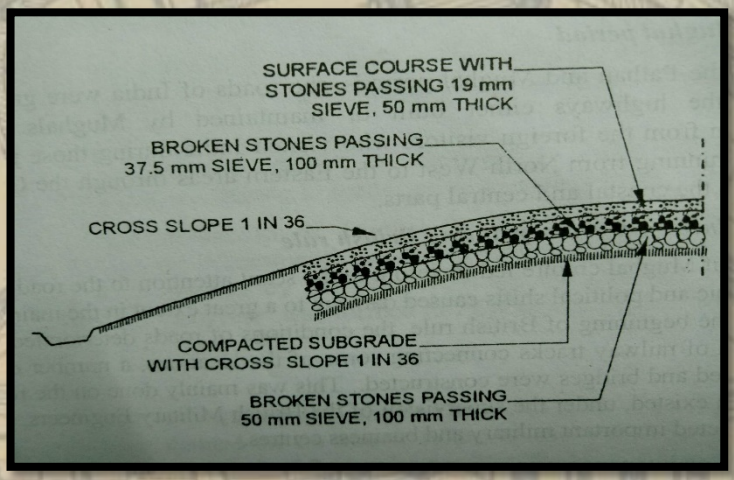
CROSS-SECTION OF TELFORD CONSTRUCTION

MACADAM METHOD OF CONSTRUCTION

The first method based on scientific thinking.

It suggests that heavy foundation stones are not necessary.

Subgrade is compacted and prepared with a cross slope of 1 in 36.

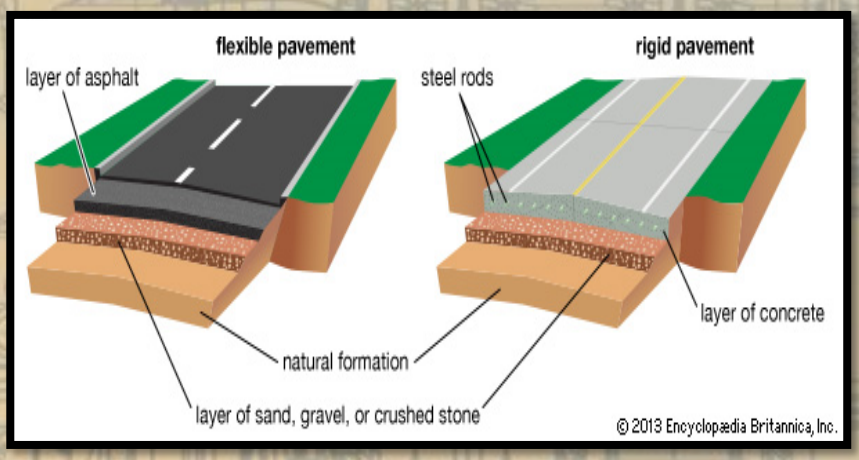


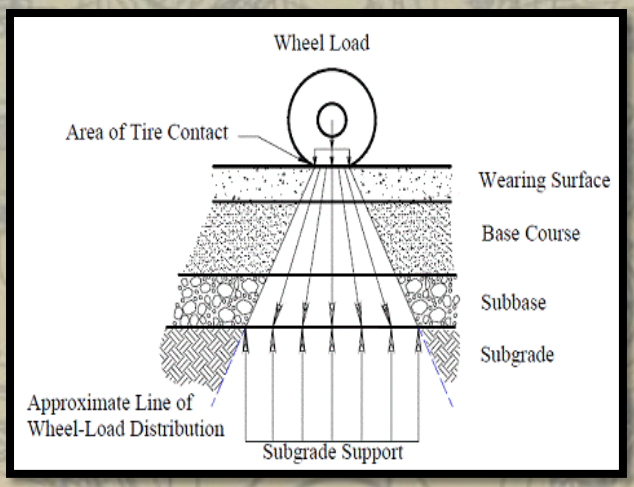
CROSS-SECTION OF MACADAM CONSTRUCTION

MODERN ROAD

1. Flexible pavement

2. 2.Rigid pavement





WHEEL LOAD DISPERSION DIAGRAM

PRESENT FACT IN INDIAN ROAD

India has an extensive road network of 3.3 million Km the second largest in the world.

Roads carry about 61% of the freight and 85% of passenger traffic.

Highways / Expressways constitute about 66,000 Kms and carry 40% of the road traffic.

The Government of India spends about Rs. 18,000 crores (US $ 4 Billion) annually on road development.

PRADHAN MANTRI GRAM SADAK YOJANA for Rural Road Development Programme.

NATIONAL HIGHWAY DEVELOPMENT PROJECT for NH Development.

MODERN TECHNOLOGY & CONSTRUCTION METHOD

- Soil stabilization.
- Use of fly ash concrete.
- Plastic pavement.
- Sub surface Drainage.
- Use of modified Bitumen.

- Use of water based emulsion.
- Reinforced earth wall.

SOIL STABILIZATION

Using lime, concrete or ash to convert poor soil into a strong impermeable medium. This can also be achieved by geosynthesis process.

Fig: Application of geosynthetic material on road

USE OF FLY ASH IN CONCRETE ROAD

- In concrete roads, FLY ASH is used to reduce the Burning Coal content by reusing the waste material.

ADVANTAGES

- Reduce heat of hydration.
- superior micro structure leading to lower permeability.
- Higher long term strength.
- Better performance in aggressive environment

PLASTIC ROAD

The plastics road consists mainly of common post-consumer products such as product packaging . Some of the most common plastics used in packaging are Poly vinyl chloride(PVC),

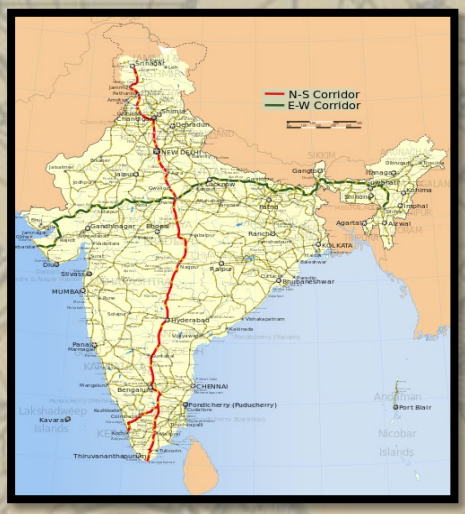
poly propylene(PP), and high and low density poly ethylene(HDPE & LDPE).

SOME RENOWNED ROAD CONSTRUCTION PROJECTS-

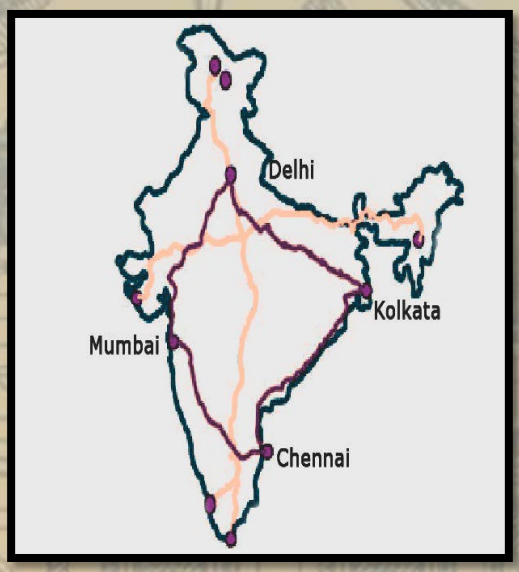
- PAN AMERCAN HIGHWAY
- WORLD LONGEST HIGHWAY
- LENGTH = 30,000KM (19,000 MI)
- ESTABLISHED IN 1923

- AUSTRALIA'S HIGHWAY 1
- WORLD LONGEST NATIONAL HIGHWAY.
- LENGTH = 14,500 KM (9,010MI) ESTABLISHED IN 1955

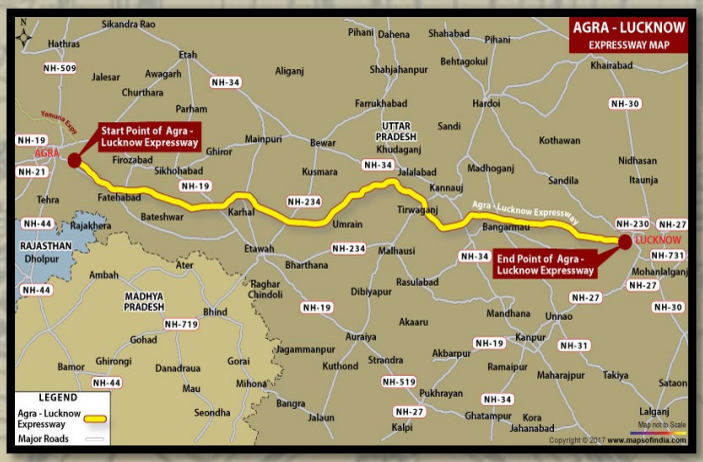
- INDIA'S LONGEST HIGHWAY
- LENGTH=3,745 KM (2,327MI)
- NORTH END :- SRINAGAR(JAMMU AND KASHMIR)
- SOUTH END :- KANYAKUMARI(TAMIL NADU)



- GOLDEN QUADRILATERAL HIGHWAY
- LENGTH - 5,846 KM (3,633 MI)



- AGRA-LUCKNOW EXPRESSWAY
- LONGEST EXPRESSWAY IN INDIA
- LENGTH=302KM(188MI)
- FROM AGRA TO LUCKNOW



- BIJU EXPRESSWAY (AFTER COMPLITION IT IS INDIA'S LONGEST EXPRESSWAY)
- LENGTH=650 KM (400MI)
- FROM JAGDALPUR(ODISHA) TO ROURKELA(CHHALTISGARH)
- (PHASE1 IS COMPLIT IN DEC.2017 & PHASE 2 IS UNDER CONSTRUCTION AND THE TARGET OF COMPLITION IN 2019)

CONCLUSION

The oldest and most common transportation network is road transport. The rapid development in road construction gives a huge impact in human civilization.

Studies on utilization of shredded polyethylene waste aggregates in hardened cement concrete

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ABSTRACT

Everyday huge amount of waste products are generated from manufacturing industries, service industries and municipal solid wastes. Increasing awareness about environmental pollution has tremendously contributed to the concerns related to disposal of general wastes. Solid waste disposal and management is one of the major environmental concerns in the world. The rate of generation of waste products is continuously increasing. Today, almost 15 % of the total plastic waste remains untreated. Disposal of non-destructible plastic waste is a big problem.

Utilization of plastic waste provides a considerable development of mechanical properties for structural and road material. It reduces landfill problem and is also energy saving. The main aim of this paper is to partly substitute and reuse non-destructible plastic waste with some development of mechanical properties of hardened concrete.

This paper presents an elaborate review on the effect of utilization of waste and recycled plastic waste materials on fresh and hardened concrete. Experimental studies are being conducted on the effect of addition of various percentages of shredded plastic

fibers content in M 25 concrete mixes. Few traces of shredded plastic fibres are used in M 25 concrete grade. The various percentage of shredded plastic content used in the concrete mix are 1%, 3%, 5% , 7 % and 10% by weight. Various parameters like compressive strength, flexural strength and tensile strength test of various concrete mixes are observed. It is expected that addition of shredded plastic fibers will lead to an improvement in the mechanical properties of hardened concrete.

Keyword: shredded plastic fiber, polyethylene plastic bags, aspect ratio of fibres, tensile strength, concrete mix.

Study on the preparation techniques and developed properties of Composite materials based on natural/artificial fiber with ceramics, polymers, and metals

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Department of Chemical Engineering, Heritage Institute Of Technology, MAKAUT

ABSTRACT

Demands of cheaper engineering materials with requisite properties have urged the development of composite materials having a weighted average of the individual properties of the components used as the dispersed phase and the matrix. In this

investigation, composites materials have been prepared with chemically refined environment-friendly bamboo, coconut and jute fibre in the form of the dispersed phase and the cement or functionalized polymer as the matrices. Chemical treatment of the raw fibres with an alkaline solution of hypochlorite produced refined lignin-free fibre which is then used in the composite preparation process followed by curing by heat under vacuum. Fine fibers are chemically treated so that the fibres attach to the matrix chemically to enhance the strength of the material much more than that physical composites or blends. The distribution patterns such as parallel, cross, perpendicular and random alignment of the (fibre) dispersed phase in the matrix (cement/functionalized polymers) have been used in the preparation process and these have given rise to different properties such as density, compressive, flexural, and tensile strength are found to be enhanced significantly improvised over the normal matrix.

The chemically modified natural fibres are laid upon a cement/ polymer matrices in molds of size 7 cm x 7 cm x 7 cm. The material in the mold is cured for seven days followed by watering the material until 28 days for the cement matrix and instantly cured for polymer matrix. compressive, flexural, and tensile strength are found to enhance significantly. The synthesized composite material is tested for standard mechanical properties and the result has been discussed. The test results show that the improvement of the standard mechanical properties of the different composites is in order of greatest for bamboo fibre, greater for coconut fibre and good for the jute fibreth.

The least cost of natural fibres, being renewable, biodegradable and biocompatible, the reduced weight of the composites, and the environmental compatibility clearly show the socioeconomic viability of composites. Based on the insights gained from analyses of the test results of the composites, the incorporation of natural fiber with further scopes of chemical

modification in making composite is one of the promising strategies to improve the performance of materials used in day to day life.

Keywords: composite; natural fibre; dispersed phase; matrix; cement; functionalised polymer; cured; alignment; mechanical properties; chemical modification; renewable; biodegrdable; biocompatible; performance.

Investigation on the utilization of Nano-silica fume in fresh and hardened cement concrete

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ABSTRACT

With the advancement in material technology in construction industry, nano-science and technology has emerged as a new field of innovation and research in material science for past few decades. Nano-technology has immense potential to result in a new generation of concrete, stronger and more durable, with desired stress-strain behaviour and possibly with the whole range

of newly introduced properties. If nano-cement particles can be processed with nano-tubes and nano-size silica particles; conductive, strong, tough, more flexible, cement-based composites can be developed with enhanced properties. Nano-fibres are also used in concrete to control plastic shrinkage cracking and drying shrinkage cracking. Some of the recent innovative and advanced manufactured nano-materials (MNMs), used in cement concrete industries are: Titanium dioxide (TiO_2) particles, Alumina (Al_2O_3), Carbon nanotube (CNT), etc. Even, replacement of cement content in concrete mixes with nano- silica particles, results in reduced usage of cement quantity and hence reduces the carbon emission content. However numerous studies show that incorporation of nano-silica (SiO_2) particles in replacement of cement in a concrete mix results in higher strength gain. In this present study, the influence of adding nano-silica particles, on the mechanical properties of concrete has been studied through measurement of compressive, split-tensile and flexural strength tests. The experimental results are found to be in favour of the various benefits brought about by nano-silica as the strength of sample specimens increased both in the early and the latter stages. Replacement of cement with 1%, 2% and 3% nano-silica by weight resulted in significant increment in compressive strength, while other mechanical properties are found to be decreased. Nowadays, silica in some form is increasingly being used in construction works and it is only a matter of time before it becomes an essential ingredient in concrete practices.

Keyword: nano silica fumes, split tensile strength test, flexural strength, compressive strength, workability.

Research works on Concrete Technology

Under the guidance of Prof. Saurav Kar & Prof. Dr. Sarmila Sahoo


10%


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YAHAGI RIVER BRIDGE ON SHIN TOMEI EXPRESSWAY

Moumita Debnath

(3rd Year)

This is the world's first hybrid type of prestressed concrete and steel corrugate cable-stayed bridge. The 235 meter main span and 820 meter overall length is the world's longest of this type of hybrid bridges. The 43.8 meter wide main girders were erected with very large transporters.

DID YOU KNOW?

Cement Plants are placed beside Thermal Power Plants in India.Why?

Niharika Nidhi

(1st Year)

Cement plant generally located near thermal power plant for better and complete utilization of *fly ash* because the utilized fly ash (toxic ash) is dumped into poorly polluting land,air and water.Fly ash disposal is very big problem for thermal power plant.Cement plant uses this fly ash for making of current.Easy availability of current plant near thermal power station.

Recently Ministry of power has launched web based monitoring system and fly ash produced between ash producers(thermal power plant) and potential ash users such as cement plants,road contractors etc. It will allow effective monitoring for increasing fly ash utilization. It will help in protecting environment in terms of saving precious top soil and conservation of land for sustainable development.

Dil Se DABANGG

SK Shahariyar Hossain

(3rd Year)

আজকের একটা বেশ "Dabangg" ঘটনা দেখলাম, একদম ফ্লাট এর সামনেই। ২টি ছেলে, যাদের মধ্যে ১টি সিগারেট এ টান দিচ্ছে, এই লোকডাউন এর মাঝেও খোসা-মেজাজে গল্প করছিলো। ২জন লোক এসে ওনাদের বললেন-"ভাই তোমরা বাড়ি যাও এখনো রাস্তায় কি করছো?" ছেলেটি বললো-"সারাক্ষন বাড়িতে থাকতে ভালো লাগছে না, একটু বেড়িয়েছি।" আগত লোক ২টো বললেন-"কি করো তোমরা?" উত্তরে ছেলে ২টি বললো-"হসপিটাল ম্যানেজেমেন্ট পড়ি। দাদা ,আপনাদের এতো জেনে কি লাভ ?!! কি করবেন জেনে !!??" লোকটি বললেন -"আমরাও তো হসপিটাল ম্যানেজেমেন্ট পরে।" এই বলে নিজেদের I.D. বের করে দেখালেন আর তারপর বজ্র কঠোর অমোঘ-বাণী, "আমরাও হসপিটালিটি ম্যানেজেমেন্ট এর কাজই করি, কিন্তু রেস্টুরেন্ট বা রিসোর্ট এ নয়, শ্রীঘর এ। শ্রীঘর বোঝো ?? মানে লক আপ.এমন হসপিটালিটি দেব না যে হসপিটাল এ ভর্তি করতে হবে। সোজা বাড়ি ফের, নাহলে সোজা গারদ এ পুড়বো।" ছেলে ২টি বুঝলো, ঘুঘু দেখেছো বাছা, ফাঁদ দেখোনি। বাক্যব্যয় না করে দুজনে দুদিকে চলে গেলো বাড়ির উদ্দেশ্যে।

AMPHAN-2020

Debasis Banerjee

(3rd year)

Cyclone 'Amphan' lay centred about 240 km south of Digha in West Bengal on Wednesday 20th May morning as an extremely severe cyclonic storm.The intensity near the centre of the storm was 170 to 180 kmph gusting to 200 kmph.

'Amphan' moved north-northeastwards and crossed West Bengal-Bangladesh coast between Digha and Hatiya, close to the Sunderbans during the afternoon to evening of Wednesday with a wind speed of 155 to 165 kmph gusting to 185 kmph as a 'very severe cyclonic storm'.

The West Bengal government evacuated more than three lakh people to safer places as the cyclonic storm 'Amphan' roared towards the coastal areas of the state, officials said.

The Met department, issued an "orange message" for West Bengal, warned of extensive damage in Kolkata, Hooghly, Howrah, South and North 24 Parganas and East Midnapore districts. It had advised that all establishments and markets remain closed in Kolkata and adjoining areas and movement of people be restricted on May 20.

There was disruption of rail and road link at several places, uprooting of communication and power poles, extensive damage to all types of 'kuccha' houses and some damage to "old badly managed pucca" structures and potential threat from flying objects. Many people lost the roof above their head due to the storm. Extensive damage to standing crops, plantations and orchards and blowing down of palm and coconut trees was observed a lot.

Wind speed along and off the coastal areas of West Bengal reached 75 to 85 kmph with gusts up to 95 kmph from Wednesday morning along and off districts of North and South 24 Parganas, East and West Midnapore, Kolkata, Howrah and Hooghly.

It gradually increased thereafter becoming 110 to 120 kmph gusting to 130 kmph over West Midnapore, Howrah, Hooghly, Kolkata and wind speed of 155 to 165 kmph gusting to 185 kmph over the districts of North and South 24 Parganas and East Midnapore of West Bengal from the afternoon to night of May 20.

Under its impact rainfall had occured in most places over the districts of Gangetic West Bengal on Wednesday, with very heavy downpour with extremely heavy rain at a few places in Kolkata, Howrah, East Midnapore, North and South 24 Parganas and Hooghly districts.

পুরুষমানুষ

Arghadeep Banerjee

(3rd Year)

পুরুষমানুষ,তাই রোজগার না করলে সমাজে কোনো মূল্য নেই;

পুরুষমানুষ,তাই জীবনের সমস্ত সুখ- আহ্লাদ বিসর্জন দিতে হয়।

পুরুষমানুষ,তাই অনেক স্বপ্ন থাকলেও তা ভুলে গিয়ে রোজগারের জন্য যেতে হয়;

পুরুষমানুষ,তাই বিয়ের আগে মেয়ের বাড়িতে প্রমাণ দিতে হয় মাইনে কত–

পুরুষমানুষ,তাই বউয়ের কথা মেনে চললে কাপুরুষ,আর না মানলে অত্যাচারী।

পুরুষমানুষ,তাই কখনো কষ্ট পেতে নেই;

পুরুষমানুষ,তাই ভেতরে ভেতরে কাঁদলেও চোখে জল আনতে নেই।

পুরুষমানুষ জানে আত্মত্যাগ কাকে বলে; বাবা শব্দটাই তার প্রমাণ দেয়।।

তোমাকে চাই

Arghadeep Banerjee
(3rd Year)

অন্ধকারে একচিলতে আলোর মতো তোমাকে চাই,
বৃষ্টি ভেজা সকালে টিনের ছাউনিতে তোমাকে চাই;
শীতের সকালে ঠান্ডা জলে তোমাকে চাই,
আটপৌরে গরম ভাতে নুনের বদলে তোমাকে চাই।
বন্ধ হয়ে যাওয়া ঘড়ির পেন্সিল ব্যাটারি তে তোমাকে চাই,
নিঃশব্দ রজনীতে ঝিঁঝির আওয়াজে তোমাকে চাই;
প্রতি বিকেলের চায়ের ভাঁড়ের সোঁদা গন্ধে তোমাকে চাই,
মন্দিরের ঘণ্টার ঢং ঢং শব্দে তোমাকে চাই;
বছরের শেষ দিনে আমি তোমাকেই চাই।।

মধ্যবিত্ত

Arghadeep Banerjee
(3rd Year)

বন্ধু মোরা কষ্টে আছি, নেই আমাদের সব;
রোজ সন্ধ্যায় সকলে মিলে করি কলরব।
বন্ধু মোরা কষ্টে আছি, এজীবন অভিশাপ;
মধ্যবিত্ত হয়ে থাকাটা মনে হচ্ছে পাপ।
মাথার ওপর ছাদ নেই, ভয়ে কাঁপে বুক;
আমরা তাও স্বপ্ন দেখি ঠিক আসবে সুখ।
ওরা শালা দিব্যি আছে,আছে টাকাকড়ি;
আমরা খালি ওদের দেখে রাগে জ্বলে মরি।
বাড়ি গাড়ি আছে ওদের, নেই কোনো কষ্ট;
আমরা হলাম কেরানি, ওরাই সর্বশ্রেষ্ঠ।
সময় ওরা পায়না, বসে করার গল্প;
কাজের চাপে ওদের কাছেসময় বড়ই অল্প।
টাকা টাকা করে ওদের যত অশান্তি,
আমরা কিন্তু কষ্টে আছি নিয়ে বুকে শান্তি।।

VOICEOVER

Arghadeep Banerjee

(3rd Year)

একটা শিশু যখন জন্ম নেয় ,ঠিক যেন একটা বিন্দুর মতন... একটা সাদা খাতায় একটা ছোট্টো বিন্দু...সেই বিন্দুটাতে যুক্ত হয় নানান বিন্দু... বাবা, মা, আত্মীয়-স্বজন, পাড়া- প্রতিবেশী সবাই। তারপর ওই বিন্দুটা আর বিন্দু থাকে না হয়ে যায় একটা ছোট্টো লাইন। তারপর ওই লাইনটা হাঁটতে শেখে সারা খাতা জুড়ে হাঁটতে থাকে ওই লাইনটা। তারপর ওই লাইনটাতে ছোটো ছোটো নানান বিন্দু আবার যুক্ত হয়। সেই বিন্দু গুলোকে আমরা বন্ধু বলে থাকি...বাংলায় 'বন্ধু', হিন্দিতে 'দোস্ত', ইংলিশে 'friend'...f..r..i..e..n..d। তারপর এই লাইনটা আস্তে আস্তে বড়ো হতে থাকে তারপরে আরও বিন্দু যুক্ত হয়। তারপরে আর ছোট্টো লাইনটা ছোট্ট হয় না, বড় হতে থাকে। সেইরকমই এই লাইনটার মাঝখানে আবার চিড় ধরে; যেমনভাবে ধরো, পেন্সিলের টানা লাইনটাতে কেউ রাবার দিয়ে মুছে দিল। লাইনটা কিছুটা ছোটো হল ঠিকই;কিন্তু দাগটাও থেকে যায়, আবার পুরোটাও মেটে না। এইরকম দাগ থেকে যাওয়া অথচ লাইন নয় এইরকম কিছু বিন্দু কিংবা লাইনকে আমরা বলি সম্পর্ক...ও ভুল বললাম ভাঙা সম্পর্ক....এরকম ভাঙা সম্পর্কের জেরে লাইনটার হয়তো কিছুটা সাইজে কমে যায়, কিন্তু তখনও ওই লাইনটার মধ্যে বিভিন্ন পেন্সিলের দাগের পেনিট্রেশন থেকে যায়, যাকে সোজা বাংলায় আমরা ছাপ বলে থাকি। ওই ছোট বয়সে আমাদের মা বাবা বলতো না খুব চেপে চেপে লিখবি না কান মুলে দেবো... opposite page এ ছাপ চলে আসতো...ওইরকম। এই পেনিট্রেশন গুলো যখন খুব deep হয় মানুষের মনে অনেকটা জায়গা জড়ো করে নেয়, সেই লাইনটা হয়তো তার জীবন থেকে চলে যায় কিন্তু ওই পেনিট্রেশনটা যেতে পারে না, সেই ছাপটা যেন থেকেই থাকে। তারপর অন্যান্য লাইন গুলো যখন তার জীবনে আবার ওই same লাইনটার জায়গা নিতে চায়, তখন তারা হয়তো সেই জায়গাটা নিয়ে ফেলে, কিন্তু ওই পেনিট্রেশনের ঘা টা তখনও থেকে যায়। ওই ধরো তোমার হাতটা পুড়ে

গেছে রান্না করতে গিয়ে, তুমি মলম লাগালে জ্বালা টা চলে গেলো, কিন্তু কোথাও না কোথাও দাগ টা থেকে যায় ।যেমন আমার একটা কপালে পক্সের দাগ আছে ,ওটা হাজার চেষ্টা করেও মিলবে না ওই ছাপ রেখে যাওয়ার মতন। যাইহোক, তো এরকম আবার লাইন তাদের জীবনে যুক্ত হয় তখন সেই মানুষটা ,যে মানুষটা ছোটো থেকে একদিন বড়ো হয়ে উঠেছে ,সে ভাবে, যে ভালোবাসার মাঝে ভালোবাসা নেই, যে সম্পর্কের মাঝে টান নেই, যে হাসির মাঝে হাসি নেই, যে কান্নার মাঝে লুকোনো হাসি নেই, যে আনন্দের মাঝে ছোটো খুনসুটি নেই, সেই সম্পর্ক কি আদৌ সত্যিকারের সম্পর্ক?..... কিন্তু বাস্তবতার জীবনে সেই পুরোনো লজিক আর নিজের সাথে নিজের মানসিক লড়াইয়ে এই ভাবনা চিন্তা গুলো এককালে ধুলোয় মিশে যায়। তখন মানুষ একটা মানুষের সাথে শুধু partner হয়ে বাঁচে ;সেটা সামাজিক বন্ধনে বাঁধা হলে তাকে husband কি wife বলা চলে ,কিন্তু ওই পেনিট্রেশনের ঘা টা তখনও থেকে যায় ।আর এই ঘা টা থেকেই যায়। এই ঘাটা মোছা খুব মুশকিল জানো....হয়তো অনেকে বলে বড়ো বড়ো মনিষীরা যে এই ঘা মোছে যখন তার partner এর সাথে তার সহবাসের পর কোনো ফল আসে । I mean to say কোনো baby হয়.... সেটা আমি মানি না ;কারন সত্যিকারের ভালোবাসা এত সহজে যায় না, আর গেলেও ওই যে বললাম, পেনিট্রেশনের দাগ টা থেকে যায়.... ভালোবাসা বড় জটিল তোপসে তাই সাধে কি ফেলুদা ওরকম ভালোবাসার চক্করে পড়েনি ,সারাজীবন একা single হয়ে কাটালো ;নিজে তো থাকলোই তার কাকার ছেলেটাকেও single করে রাখলো, তোপসে কে....তো আমি ফেলুদা fan.....আমি single.....

Lift-এ

Arghadeep Banerjee

(3rd Year)

১.

ইকবাল আজ তাড়াহুড়ো করে অফিসের সমস্ত কাজ শেষ করে lift নেবে বলে lift এর সামনে এসে দাঁড়ালো।আজ ইকবালের মায়ের জন্মদিন।মায়ের জন্য একটা surprise plan করে রেখেছে।খুব ছোটবেলায় ওর বাবা মারা গেছে।মা অনেক কষ্ট করে একাহাতে ইকবালকে বড়ো করেছে।আজ ইকবাল যে জায়গায় আছে সবটাই ওর মায়ের অক্লান্ত সাধনার ফল।ও মনে মনে plan করেই রেখেছে মাকে একটা জুঁই ফুলের মালা দেবে। জুঁই ফুল ওর মায়ের খুবই প্রিয়।তাই school থেকে বাড়ি ফেরার পথে ইকবাল জুঁই ফুল কুড়িয়ে আনতো।Lift টা আসতেই ইকবাল ভিতরে ঢুকে B press করলো আর বারবার বাঁ হাতের হাতঘড়িটার দিকে দেখতে লাগলো।মনের মধ্যে একটা চরম উন্মাদনা চলছে,কখন বাড়ি যাবে আর মায়ের নিষ্পাপ,অমলিন হাসিটা দেখবে। এরইমধ্যে যখন 7th floor এ lift টা এসে থমকে গেলো তখন মনের মধ্যে একরাশ বিরক্তি এসে ভিড় করলো,"ধুউউস্! ভাল্লাগেনা,আজকেই সবাইকে lift use করতে হবে।অন্যসময় fitness, healthy থাকার কথা বলে সিঁড়ি ব্যবহার করবে,আর আজ যেহেতু আমার তাড়া,সবাইকে আজকেই lift নিতে হবে....."কিন্তু ইকবালের মনের কথা মনেই রয়ে গেলো।ভিতরে যে প্রবেশ করলো তারজন্য ইকবাল মোটেও প্রস্তুত ছিলো না। শাঁখা সিঁদুর পড়ে একদম অন্য সাজে রুমি।রুমিকে দেখেই ইকবালের কান মাথা ভোঁ ভোঁ করে উঠলো।ইকবাল যেনো সমস্ত চলৎশক্তি হারিয়ে ফেলে স্থবির হয়ে রইলো।যে ইকবালের অফিসে সবার সামনে presentation দিতে একটুও গলা কাঁপে না,আজ সে বাকশক্তিহীন হয়ে পড়েছে,গলা শুকিয়ে আসছে,নিজের হৃৎস্পন্দন শুনতে

পাচ্ছে।ইকবাল অবাক চোখে রুমির দিকে তাকিয়ে রইলো আর প্রতিটা ভঙ্গিমা লক্ষ্য করতে থাকলো।রুমি মাঝে মাঝে মোবাইলটার দিকে দেখছে আর lift এর নম্বর গুলোর দিকে দেখছে। খুবই জড়োসড়ো হয়ে এক কোণে দাঁড়িয়ে আছে আর bag এ কি যেনো একটা খুঁজছে।ইকবাল আরও দেখতে পেলো রুমির হাত ও পিঠের অনাবৃত অংশে আঁচড় এবং কালশিটের দাগ। অনেক্ষন পর ইকবাল সমস্ত ঘোর কাটিয়ে হাল্কা গলায় জিজ্ঞাসা করলো,"রুমি.....ভালো আছো?"রুমি আচমকা কণ্ঠস্বর শুনতে পেয়ে অদ্ভুতভাবে ইকবালের দিকে তাকালো। ঠোঁটে পাতলা কুয়াশার মতো হাসি - অবাক, দুঃখ না পুরানো প্রেমিককে আবার দেখতে পাওয়ার আনন্দ?- শুধু নিষ্পলক দৃষ্টিতে ইকবালের দিকে তাকিয়েছিলো। হঠাৎ lift থমকে যেতে রুমির জ্ঞান ফিরলো। রুমি তাড়াহুড়ো করে lift থেকে বেরিয়ে গেলো,মুখের মধ্যে একটা ভয়ের ভাব,যেনো কোনো বড়ো অশান্তির পূর্বাভাস পেয়েছে।ইকবাল দেখতে পেলো উল্টোদিকে একজন বলিষ্ঠ ভদ্রলোক।রুমি বেরোতেই যা নয় তাই অপমান করতে লাগলো।Lift এর দরজাটা বন্ধ হয়ে গেলো,আবার নীচে নামতে শুরু করলো। ইকবালের মনে হতে লাগলো,সে যেনো বর্তমান সময় থেকে কয়েক লক্ষ আলোকবর্ষ দূরে চলে যাচ্ছে।যেখানে ইকবাল রুমির সেই করুণ মুখটা ছাড়া আর কিচ্ছু দেখতে পেলো না।ইকবাল রুমিকে চাইছে কিন্তু রুমি হারিয়ে যাচ্ছে কালো অন্ধকারে।ইকবাল রিক্ত নিঃস্ব হাতে দাঁড়িয়ে আছে।

২.

ইকবাল ওর নতুন কেনা গাড়িতে করে বাড়ি ফিরছে। কিন্তু বাড়ি ফেরার উন্মাদনাটা কোথায় যেনো ম্লান হয়ে গেছে।Lift এর ঘটনাটা ওর দেহ মনকে নাড়িয়ে দিয়েছে।ওর মন ফিরে গেছে ওদের college জীবনে।যেদিন college র fest এ ওদের প্রথম আলাপ হয়েছিল।একটা গানে ওরা একসাথে কণ্ঠ মিলিয়েছিলো।এরপর গঙ্গার ঘাটে প্রথম প্রেম নিবেদন।রুমিও সাড়া দিয়েছিল ওর নিবেদনে।এরপর college

life র তিনটে বছর ওদের স্বপ্নের মতো কেটেছিল। আইসক্রিম-ফুচকা খাওয়া নিয়ে খুনসুটি, পড়ন্ত বিকেলের রোদ্দুরে একে অপরের হাত ধরে হাঁটা, অস্তায়মান সূর্যের দিকে তাকিয়ে দুজনের দুজনের প্রতি অঙ্গীকার,একসাথে ঈদ ও দুর্গাপুজো পালন করা - সবকিছু।ইকবালের মনে হয় ওদের এই মুহূর্তগুলোকে কোনো শিল্পী যেনো খুব সুন্দরভাবে তার মনের মাধুরী মিশিয়ে রচনা করেছে।তাইতো এই স্মৃতিগুলো আজও অমলিন।কিন্তু আজ যেটা দেখলো ইকবাল সেটা তো বিশ্বাসই করতে পারছে না।বিশ্বাস করা তো দূর, ভাবলেই ওর শরীর কেঁপে উঠছে।রুমির পরিবার ওদের এই সম্পর্কটা মেনে নেয়নি।তারওপর ইকবাল তখন সেইভাবে কিছু একটা করতোও না।শুধু এইটুকু শুনেছিল রুমির স্বামী নাকি খুবই উচ্চপদস্থ কর্মকর্তা।ভালো অঙ্কের রোজগার করে।ইকবাল তাই নিজে থেকে আর কোনো খোঁজ খবর নেয়নি।ভেবেছিল রুমি হয়তো ওর সাথে থাকলে অতটা সুখ-স্বাচ্ছন্দ্য-বিলাসিতায় থাকতে পারবে না।কিন্তু আজকের ঘটনাটা তো ওর বাস্তব আর কল্পনা থেকে অনেক, অনেক দূরে।একটার সাথে একটার তো কোনো মিলই নেই।আচমকা কোনো দমকা ঢেউ যখন আসে মানুষ তারজন্য প্রস্তুত থাকে না,খড়কুটোর মতো ভেসে যায়।আজকের ঘটনাটা ইকবালের কাছে সেইরকম।রুমির ওই ভাবলেশহীন চোখ, ভীত সন্ত্রস্ত মুখ,না বলা কথা - ইকবালকে একধাক্কায় ভাসিয়ে নিয়ে চলে গেলো অনেক দূরে।শুধু একটা কথাই মনের মধ্যে ঘুরপাক খেতে লাগলো,"তুমি ভালো নেই.....তুমি ভালো নেই.....

Why Civil?

Brishti Bose

(1st Year)

As a first year student, we tend to be the saplings which might grow into gardens and forests thus, enriching the world. But henceforth, we often come across a question as to WHY CIVIL? Surprisingly, the speaker answers it himself in the terms of popularity, scope, placements and all other superficial terms. Therefore, we can conclude from this, that the World is hypnotized in an extremely illogical way. They have learnt and accepted what was preached to them and are religiously passing on the same.

Often civil engineers in making are questioned about the quality of bridges they are going to make and countered with the fact that no matter what, they r meant to do the same. Thus, it proves that lack of education amongst the people regarding the vivid nature of the subject and therefore leads to non-civil engineer parents discouraging their kids from taking up civil engineering. As if, this branch believes only nepotism.

But the effing logic behind it can be explained in a line. ”What is the point of learning about roads, transportation, soil or structure, leaving software aside?!”

Well, honestly speaking, there isn’t any fruit to try and make them understand the economic growth that follows the formation of highways, the industrial growth that follows the improvement in transportation, the reduction in chances of fatality that follows proper geotechnical and environmental supervision.

Civil is a stream that will never loose it’s position in the industrial growth rate of India, even if The United States boycott foreign civil engineers in their country. But there is still a long way for the people to understand that. Maybe, that’s why our country is still a ’developing’ one. But we cannot stop. Can we?

UNFOLLOWING THE TREND

Raj Mani

(1st Year)

There is a trend which is now common between the engineering students and a very few of them are unfollowing it and i'm the one among those few ones. And at last, i wanted to plant a seed of new thought.

Let's discuss about the trend first and then what trend I'm unfollowing and why.

I'm talking about the engineering students and the 1st most common trend is to fight hard for the best college, but there's another trend which is blindly followed by those thousands of engineering students before getting into the engineering life.

The trend is about getting into college with CS or IT branch irrespective of their own interests. This is what I'm talking about and this is what I successfully kept a distances from. Where the people, who were craving for the branches like CSE or IT , I madly wanted to persue Civil engineering and I'm in 1st year and lovingly persuing it too.

The main fact that must be noted here is , it must be about their interest not about the trend created by a society. There happened some cases like , students left their seat in CE or so, for departments like CSE and IT and those seats left vaccant. Is it about the future for getting placed or making money?

Then I must mention , if u have an interest in your work nobody can stop u from enjoying a happy life and making money.

We are civil engineers, we reshape the world, which is the beautiful creation of God, into more beautiful and more suitable world according to your needs. we build the beautiful and amazing

infrastructure which every country boast for. We build the roads and that's why travelling is getting more and more comfortable than before. We build the house for billions of people which they transform into a HOME. And I'm sure , you must be reading comfortably beneath the roof which must have been made by a civil engineer. And I'm proud for it, that we are the reshaper of the this God's creation and for creating homes to our people. Keeping interest aside, it has tremendous capacity to give an engineer a stable life ahead. I can see myself in a better position with my civil engineering department in future creating homes and infrastructure for our people and I'll be having a healthy and wealthy life because of Civil engineering only. It has immense opportunity that if you could seek one, you would be giving lots of opportunities to other.

So, it's not about the trend, it's about you and your interest only. DO you just want to be trend follower or be a trend setter? I'm sure what you want. Just follow the trend and follow your dream, it's enough to lead you to success. I hope you'll be having that new seed of thought in you after this.

WHEN THE MIND IS PURE, JOY FOLLOWS LIKE A SHADOW THAT NEVER LEAVES

Soumika Biswas

(2nd Year)

Success is very important part of our life. It is the guide to reach the destiny of life. To get success, a controlled mind is very important and for that there is a relation in between mind and success.

On your road of success, you have to apart from your own attitude, your commitment, your hard work, and any more of your personal merits in attaining perfect success. If you wish to get things what happen in your favor, don't get the situation disturbed, instead mould other persons in your favor. For this you have to handle the people with care. It is better not to criticize people and not to complain.

Tips for how to make people like you??

- **What you want from others, you do the same to others.**
- **You have to be interested in others, and then they love you.**
- **Greet everyone with a smile, smile is a natural expression.**
- **Make other person feel important and try to give good advices.**
- **No argument, welcome the disagreement and listen them first, then you slowly pickup your points.**

Many of us are defined in the life journey. But we have to be patience, we don't give up anymore, success will come in the right time. And to make you a successful person you have to be a good

conversationalist, you have to do something which creates an interest in others about yourselves.

"SUCCESS WILL COME IN THE RIGHT TIME IF YOUR MIND IS IN A RIGHT WAY."

POSITIVITY

Srimayee Dey

(2nd year)

POSITIVITY, the most Living word I feel
You can only shine, when you have the power to heal..
You have fear, you have insecurities
You have regrets ,makes you fill yourself with negativity..
Look at the SUN, face the light,
Eat all the goodness, that makes you more bright..
Don't let negativity fill your subconscious mind,
Spread the happiness from the core and be kind..
You will feel lonely, leads you feel scared
Don't let it consume the happiness, deal it with care..
Nowadays, when the world is losing faith with all the hatred
Let your positive efforts keep the world awake..
Ride on positivity to take the journey of miles,
Be wise, have pride, and face the world with smile..

THE PICTURESQUE CANVAS

Srweja Majumder

(1st Year)

The clock showed 5:45. Darkness was slowly engulfing the town. The sun had just gone down. In the distance the mountains were standing with their heads crowned with the clouds. And Trishul had just fallen asleep. It was quiet all around. We all were quiet as it was their bedtime. Like babies they were dosing and finally everyone was asleep. It was all dark now. The clock showed 6:30. In the darkness we could see the sparkles on their night suit. Yes, the mountains and the town of Kausani was dreaming now. Only we could see lights of the few hotels and the villagers' homes.

The warmth of the cup was giving my cold hands some comfort. My soul was enjoying the flavour of the tea. I could hear someone squeak. Oh, it were the mice. Actually we had skipped our lunch so they were alarming me by running about in my tummy. Deciding to have our dinner early by 7:30we ordered some chicken curry and roti. The food made me feel in heaven. And by 9 we were also in our bed. Mom was listening to music and dad was busy reading. And I? I kept thinking and thinking "Will I be able to see them tomorrow? All three of them?",and I do not know when I had closed my eyes and was busy dreaming.

I was woken by some light on my eyes. It was 6:30. Sun had woken up and had started playing by throwing his light on our face. The golden yellow rays had lighted up our room. “ They must have woken up by now.” I thought to myself. So I rushed into the balcony. The cold wind seemed like the edge of a knife. But warmth of the sun and the chill of the wind filled my soul with a magical happiness. And there they were. Standing with the scarf of fog on them and adorned with the golden rays of the sun. All three of them. Trishul, Nandadevi and Nandaghunti. Yes, it was the day when I really understood the meaning of the phrase “Early to bed, early to rise, makes a man healthy, wealthy and wise” . I was feeling healthier than before and wealthier as well because of the gift whichnature had gifted me. The view of the peaks was equal to the joy of finding some gold coins.

And all through the morning three of them played hide and seek with me. Sometimes coming out of the clouds and sometimes fully behind them. Kausani might be a small town. But it was a wealthy town. Thinking why? It had with it the most valuable asset. Fresh air and natural beauty.

AN AWAKENING VIRUS FOR CIVILIANS

Ritabrata Biswas

(2nd Year)

Again the time has proved that if the foundation is weak, any small damage can affect the structure and start spreading and affecting its whole area without bothering about how strong the structure is. At present the element to damage the structure of the world is Corona virus (SARS-CoV-2); which is basically a virus that never starts showing its effect until we directly contact the affected person or affected things and invite it to enter our system. That's why social distancing is the basic and most effective way to reduce its spreading. Also repeated hand washing, covering mouth during coughing and sneezing are the additional preventive measures against the spread of this virus.

So, we can easily understand that, to prevent the spreading of this virus we don't need to follow any complex discipline in daily life. Just we need to follow some basic simple habits like staying at home, maintaining social distancing, washing hands repeatedly (especially before touching face, mouth, eyes, nose), covering mouth during coughing or sneezing, maintaining hygiene etc.; and using our common sense. And still if someone cannot follow these simple habits then definitely the foundation will be weak and the spreading will increase rapidly.

Therefore we need to realize that good WaSH system; which involves good Water, good Sanitation and good Hygiene is a daily-life-habit based additional preventive measure against many severe diseases along with COVID-19 also.

According to a statistical data of United Nations, 2.2 billion people lack access to safely managed drinking water services and

4.2 billion people lack safely managed sanitation services. More than 297000 children of age under five years die annually around the world from different diseases due to poor sanitation, poor hygiene or unsafe water drinking.

So, to reduce these huge numbers; the wash system development issue has to considered as one of the most important goal across the world. It should be mandatorily included in education globally; the realization of the importance of wash system and awareness should be delivered to students along with maintaining proper wash system in educational institutions.

In any professional working place, working site, healthcare unit the wash system has to be included in safety measures and proper wash infrastructure has to be implemented with proper maintenance system.

The rural areas, where the wash infrastructure is lacking, should be equipped with proper wash facilities along with proper maintenance. The people of rural areas should be made aware of the importance of wash and habits to follow to maintain good hygiene.

People who are the frontline of defense against emergency conditions i.e. healthcare workers, medical staff, police staff, army staff etc. should be equipped with proper wash techniques to maintain good hygiene in professional and personal life.

Hence, the time has come to take steps for eradicating the roots of severe health issues by developing the WaSH system by the means of education, awareness, actions, infrastructures, utilization and maintenance system across the globe.

PHOTOGRAPHY SECTION

Angshuman Kar

(2nd Year)


PATUA FOLK PA

Debjit Podder

(3rd Year)


Debjit Podder


Debjit Podder


Debjit Podder


Debjit Podder

Mousumi Dutta

(3rd Year)

Souvik Sen

(3rd Year)

Sagnick Chakraborty

(3rd Year)

Shayan Das

(2nd Year)

Shivam Shandilya

(1st Year)

Sinora Rai

(2nd Year)

SK Shahariyar Hossain

(3rd Year

SUDOKU

Indranil Pal

(3rd Year)

QUESTION :

	4		3			2		
							9	6
				7		8		
		1		6				
7							1	
		9				6		
9			2					4
	2			4	6		5	
	7	8	9					

SOLUTION :

6	4	5	3	8	9	2	7	1
8	1	7	4	2	5	3	9	6
3	9	2	6	7	1	8	4	5
2	3	1	5	6	7	4	8	9
7	6	4	8	9	2	5	1	3
5	8	9	1	3	4	6	2	7
9	5	6	2	1	8	7	3	4
1	2	3	7	4	6	9	5	8
4	7	8	9	5	3	1	6	2