



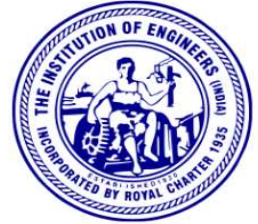
Association of Civil Engineering Students

December 2021

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THE BENCHMARK



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Editor's Desk



We are pleased to present December 2021 edition of Benchmark. In this edition you will find an article on The Channel Tunnel and contribution by Students and Faculty members of Department of Civil Engineering highlighted in the month of November. News update and departmental activities are the part along with Canva.

Department Vision:

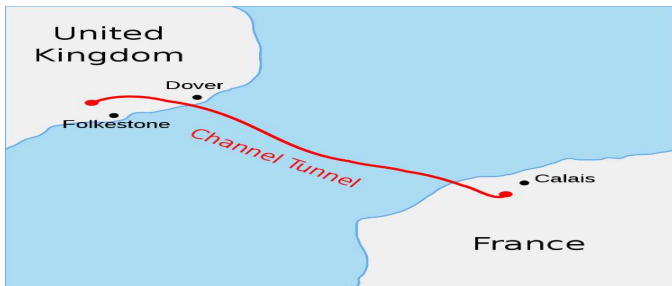
- To excel in every area of Civil Engineering, inculcate research oriented study to explore hidden talent.
- Providing Opportunity to display creativity, out of the box thinking & innovativeness, aimed at providing cutting edge technology for sustainable development.

Department Mission:

- Providing qualified, motivated faculties to deliver the content using updated teaching methodology, inviting industry experts from various areas to disseminate subject knowledge in Civil Engineering.
- Motivating students to undertake the Research Oriented studies, participate in competitions at all levels, grasping new techniques and methods which can be improved on further.
- Conducting and participating in seminars, workshops and training programs with a view to make the students industry ready and improve their employability factor for global career ahead.
- To create quality professionals capable of planning, designing and analytical skills for better infrastructural development in the field of Civil Engineering.

Channel Tunnel

The Channel Tunnel also known as the Chunnel Tunnel, had been Recognized together as the “Seven Wonders of the fashionable World” by the American Society of Civil Engineers. It is a 32-mile underwater railway tunnel that plays an important role to link Folkestone, England, and Calais, France beneath the English Channel. A venture was signed between England and France, for the construction of the Tunnel. This began in 1988 and was completed in 1994. Even though construction started in 1988 and was opened in 1994, the thought to possess a cross-channel tunnel was first raised into discussion quite 200 years ago but didn't materialize due to some political, national security, and price considerations. However, with the increase in traffic growth over a period of time, better and alternative means of communication, convenience and speed were necessary and hence the need for an alternate transport route was needed.



The Tunnel's lowest point is 250 feet deep while the portion of rail underwater is 23.5 miles. Train speed reaches 100 miles per hour while a visit between the 2 cities takes only 20 minutes. The Tunnel plays an important role in connecting the 2 countries and serves the transportation needs of

over seven million people a year who travel on the Eurostar trains.



The Chunnel officially opened on May 6, 1994. An engineering feat, the chunnel is a powerful piece of infrastructure. Over 13,000 skilled and unskilled workers were hired to create the channel. The chunnel consists of three tunnels: two running tunnels carry the trains and a smaller, middle tunnel is employed as a service tunnel.

Although initially estimated cost of the project was \$3.6 billion, the chunnel project came in over budget at over \$15 billion when completed. The Tunnel is nothing in need of a contemporary engineering marvel. Fires were an enormous concern at the time engineers were building the tunnel. Therefore, the necessity for an emergency route was crucial. A system of three tubes makes up The Tunnel—two full-size tubes for rail traffic and one small tube in between for emergency access. The emergency tunnel was put to check when a fireplace on a train broke out a year after the tunnel was built. Thirty-one people were trapped and were ready to escape safely using the emergency route.

-BY PRANEET HEGDE
B.E. CIVIL

DID YOU KNOW

The Olympic Torch traveled through the tunnel in 2012 on its thanks to hosting city, London

*To know more about Three Gorges Dam,
Scan the QR Code*



Incorporating Universal Human Values in Education

(An AICTE initiative)

This workshop is about living with fulfilment in our practical day-to-day life. Education is expected to facilitate this aspiration by helping the student to develop a holistic world view as well as the practical skills for living with fulfilment, i.e., living in harmony as an individual as well as with family, society and the natural environment.

On the first day of FDP speakers talked about **Three Basic Parameters For Living with Happiness and Fulfilments in Our Daily Life** are

- 1) **Natural acceptance**
- 2) **Right understanding**
- 3) **Relationship and physical facility**

“The state or situation, in which I live, if there is harmony / synergy in it, it is Naturally Acceptable to me to be in that state / situation”.

When we are in harmony within, we are in state of happiness. When we are in a state of contradiction within, we are in the state of unhappiness. Therefore:

Happiness is to be in a state of harmony.

Unhappiness is to be forced to be in a state of contradiction.

Education is developing the right understanding (holistic perspective).

Sanskar is the commitment, preparation and practice of living with right understanding.

The preparation includes learning appropriate skills and technology.

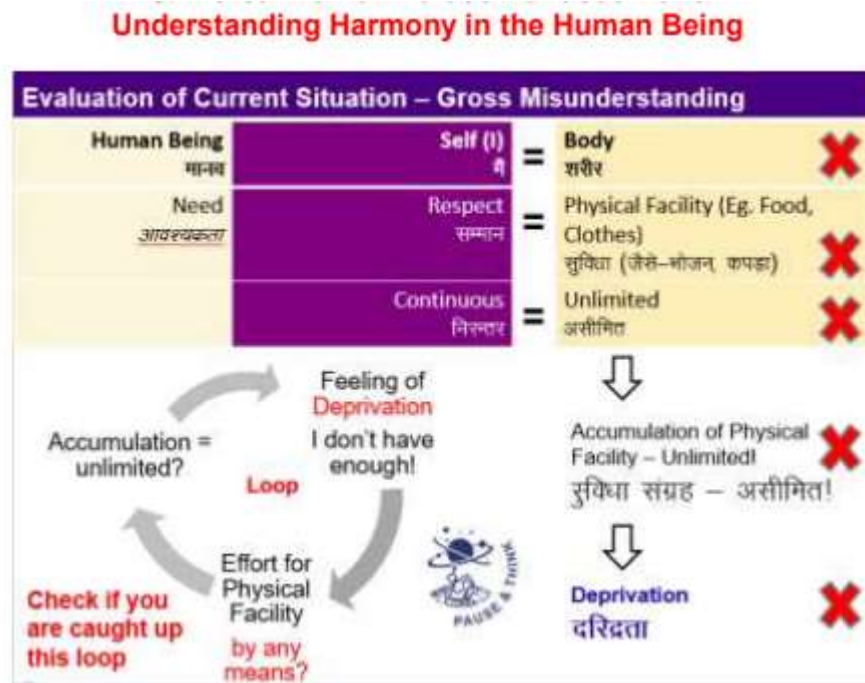
Human being wants to live with continuous happiness and prosperity and this is possible by ensuring right understanding, fulfilment in relationship and physical facility in the correct priority. This is living with ‘human consciousness’.

On the other hand, if one is living for physical facility alone, and not ensuring right understanding and right feeling in relationship, s(he) feels unhappy and makes others unhappy too.

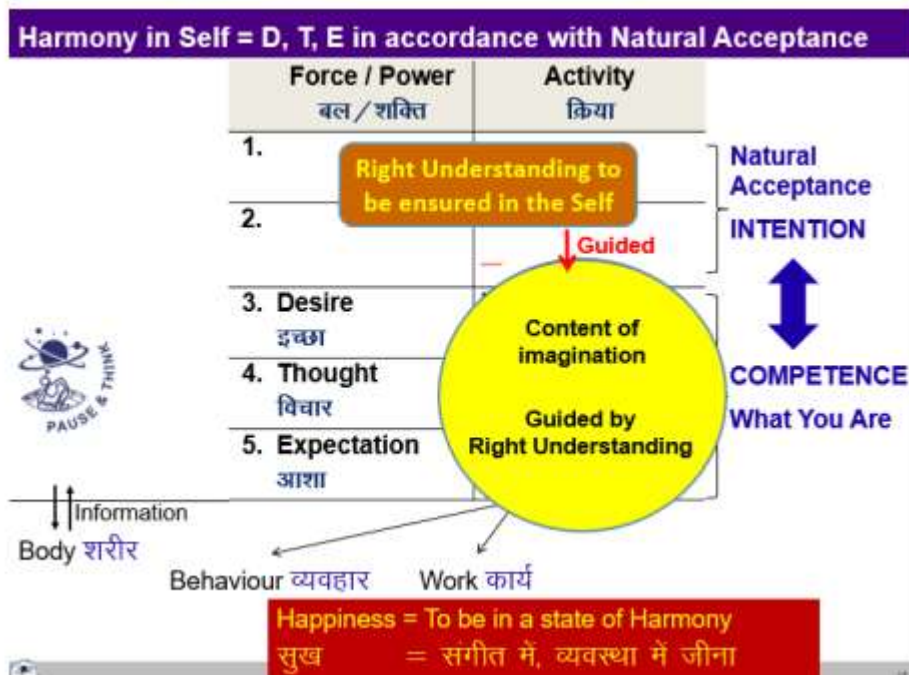


Second day experts discussed about ‘Understanding the Human Being’.

The needs of the Self and the Body are of two different types, so they have to be fulfilled separately. A gross misunderstanding is to assume the two to be the same, and this leads to the feeling of deprivation and exploitation.



The activities of desire, thought and expectation are together called imagination. Imagination is continuously going on in the Self. The sources of imagination can be sensation, pre-conditioning or natural acceptance. There is harmony in the Self when the imagination is in line with one's natural acceptance. Harmony in the Self is in continuity when all the activities of the Self are awakened.

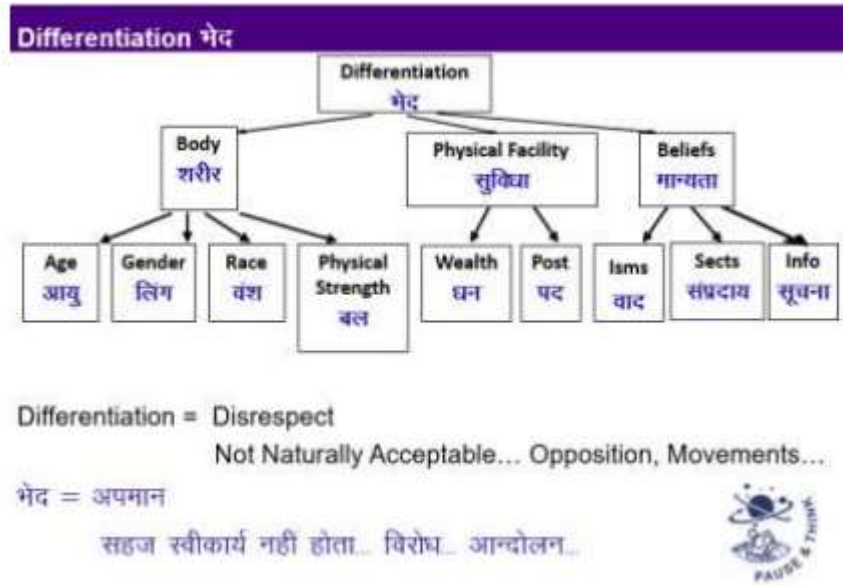


When the Self has a feeling of self-regulation (the responsibility for nurturing, protection and right utilisation of the Body), and it is able to fulfil this responsibility, the Body is in harmony (good health). This feeling of self-regulation is instrumental in identifying the need for physical facility and ensuring prosperity.

Third day Talk were related to **“How to develop good relationship between the family”**.

Trust is to be assured that the other has a natural acceptance (intention) to make me happy and prosperous. Trust on intention is the foundation of relationship. It is the beginning of mutual development. A common mistake is to evaluate oneself on the basis of one’s intention (and conclude that I am good) and the other on the basis of their lack of competence (thus doubt their intention and conclude that the other is bad).

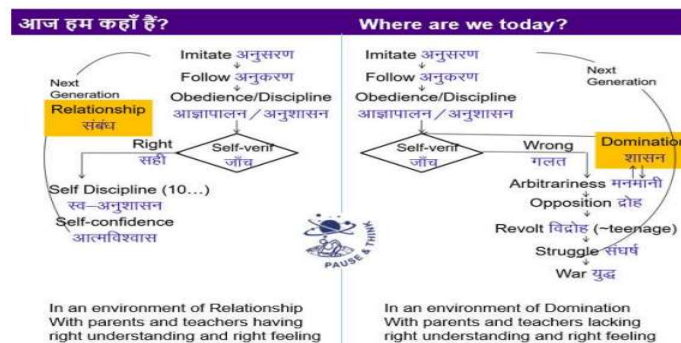
Respect is right evaluation at the level of the Self. The complete content of respect is to see that the other is similar to me in terms of purpose, programme and potential; and we are complementary to each other in terms of competence. Over evaluation, under/otherwise evaluation and discrimination are disrespect.



Fourth day talk was about **‘How to create harmony in the society’**.

Education is to develop right understanding of the harmony at all levels of being – from self to the entire existence (individual, family, society, and nature/existence).

At the level of society, the human goal is right understanding and right feeling (happiness) in every individual, prosperity in every family, fearlessness (trust) in society and co-existence (mutual fulfilment) in nature/existence. This goal is fulfilled by human order, i.e. systems for education-sanskar, health-self regulation, production-work, justice-preservation and exchange-storage. These systems start with the family order, and are interconnected right up to world family order, leading to universal human order. The natural process of development of a child in an environment of relationship needs to be understood and fulfilled so that the child grows into a human being who can have the competence to participate in the universal human order.



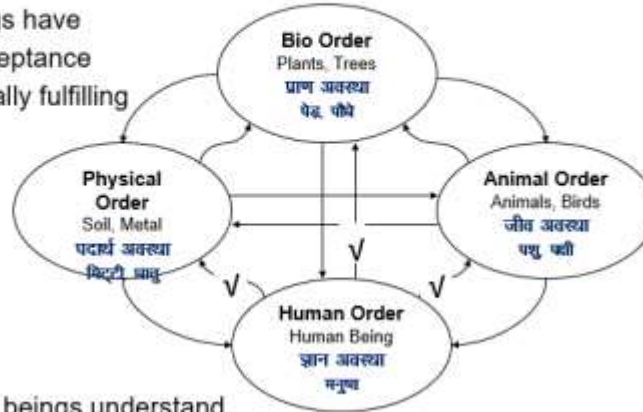
Fifth and last day was devoted to “Understanding Harmony with Nature”.

Nature is the collection of units. It can be classified into four orders, (physical, bio, animal and human). There is a relationship of mutual fulfilment amongst these. It is already going on in the first three orders. Human being also has the natural acceptance for mutual fulfilment. All that we need to do is to understand it and live accordingly.

Relationship of Mutual Fulfillment परस्पर पूरकता का संबंध

Physical Order, Bio Order and Animal Order are enriching for Human Order, but Human Order (without right understanding) is not fulfilling for any of the 4 orders

Human beings have natural acceptance to be mutually fulfilling



Once human beings understand, they can be fulfilling for all four orders

The speakers who delivered their talks on “Universal Human values” in 5 day FDP are as follows RP Mr.UmeshJadhav, ST Mrs.NidhiChiragSachade, RP Prof Gajendra Singh, RP Dr.Vanchana Singh, PRP Dr.ManishaShukla, RP Dr Kumar Sambhav

FDP on “Universal Human Values” was conducted from 15 to 19 November 2021. From civil department Mr. Rajesh Dubey, Mr. ShreyansDodia and Mr.YuvrajChavda had attended this program.

DID YOU KNOW

Eleven boring machines were went to dig the Channel Tunnel. Together they weighed an entire of 12,000 tonnes (more than the Eiffel Tower), while each was as long as two football pitches. One from British side remains buried under the Channel. Another was sold on eBay for £39,999 in 2004.

During construction of Channel Tunnel, the united kingdom increased in size by about 90 acres, when all the world faraway from under the ocean was dumped. In France, the world removed was used for a replacement hill.

“SURROGATE SAFETY EVALUATION OF UNSIGNALIZED INTERSECTIONS THROUGH POST ENCROACHMENT TIME”

KHUSHI ASHISH PATIL
ROHAN RAMESH TALEKAR
KENIL GIRISH BHADESIA

UNDER THE GUIDANCE OF PROF. ASIR KHAN

NEED OF THE STUDY:

Traffic safety is an important area in transportation engineering. The developing countries are accounted with rapid growth in travel demand due to the rapid economic growth in the cities. At the same time due to the non-availability of adequate, efficient, and economical public transportation services in cities have made people use their vehicles to move around. Intersections act as a node where traffic flow merges or diverges and is the most critical location in traffic safety and performance. Intersections pose particular safety concerns because of the unsafe driver's actions and maneuvers. The conflicts at the intersection include merging, diverging, crossing, and weaving conflicts apart from the abrupt changes in vehicle speeds and unexpected lane changes and, therefore, pose particular safety implications.

According to a road accident report by the Ministry of road transport and highway(MORTH, 2019), 20.6% of the crashes were recorded at the un-signalized intersections shown in Table 1.1. Among different road junctions, four-arm junctions accounted for the second-highest number of crashes (17.85%). Within road junctions, especially uncontrolled junctions accounted for 72.25% of fatality shown in Table 1.2.

Traffic Control	Number of accidents (share)	Persons killed (share)	Persons Injured (share)
Traffic light signal	9719 (7.86)	2839 (7.22)	8890 (7.75)
Police Control	10425 (8.21)	3501 (8.74)	9524 (8.14)
Stop sign	6461 (5.00)	2439 (6.08)	5458 (4.65)
Flashing Signal	6239 (5.00)	2222 (5.70)	5494 (4.65)
Uncontrolled	92654 (73.57)	28727 (72.24)	87489 (75.19)
Total	125498	39728	116585

Table1.1. Accidents by type of Traffic control-2019

Junction type	Number of accidents (share)	Persons killed (share)	Persons Injured (share)
T-Junction	11478 (31.73)	2083 (31.20)	10271 (32.10)
Y-junction	5397 (14.84)	895 (13.33)	4831 (15.01)
Four arm Intersection	8484 (23.28)	1593 (24.00)	7330 (22.86)
Staggered Junction	6700 (18.49)	1089 (16.27)	6076 (18.94)
Roundabout	4173 (11.64)	831 (12.53)	3619 (11.31)
Total	36232	6491	32127

Table1.2.Accidents by road junction type-2019

During the late 1980s, the authors used the Reactive approach for the Accidental analysis, which required reported accidental data, but in developing countries, most minor accidents are unreported. In spite, the author required rich data set for getting awesome sauce results. But it is an unethical practice to wait for someone's Injury/Death. Hence during recent decades, the authors are concentrated on the Proactive approach based on the Surrogate Safety Measures (SSM). Conflicts are occurring more frequently than accidents. This is the major advantage of using the Proximal Safety Indicators in the accidental analysis. The usage of proximal safety indicators represents the temporal and spatial proximity characteristics of unsafe interactions and near-crashes. There are many Surrogate Safety Measures like Time of Collision (TTC), Gap Time(GT), Post Encroachment time(PET), deceleration Rate(DR). Crossing Conflicts are a major prone zone for the occurrence of accidents at the Uncontrolled Intersection. For such type of study most suitable SSM is PET as per old papers. This study aims to assess the level of traffic safety at an uncontrolled four-armed intersection using SSMs under mixed traffic conditions by devising a unique strategy of measuring safety indicator, Post Encroachment Time.

RESEARCH OBJECTIVES:

The study's main aim is to model the critical traffic conflicts, Severity of an accident at Unsignalized intersections, evaluate the traffic safety assessment at Unsignalized intersections using proximity safety indicators and post encroachment time (PET). The following objectives are formulated.

- To study the vehicle interaction between two different vehicle classes.
- To find out the average PET value
- To find out the probability and percentage of critical conflicts.
- Create a matrix of conflicting and offending vehicles.

THEORY AND METHODOLOGY OF THE PROJECT:

POST ENCROACHMENT TIME (PET):

For heterogeneous traffic conditions prevailing in developing countries like India, researchers have applied Post Encroachment Time (PET) as a surrogate safety measure to evaluate safety at un-signalized intersection.

"Time-lapse between the end of encroachment of turning vehicle and the time that the through vehicle actually arrives at the potential point of collision." **PET= T2-T1**

Where, T1= Time, when the offending vehicle leaves the conflict region:

T2= Time, when the conflicting vehicle enters the conflict region.

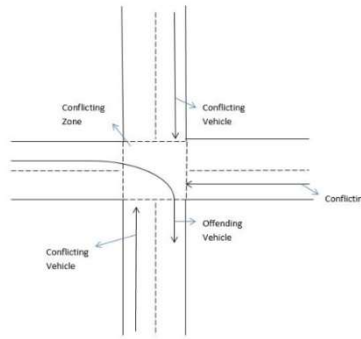


Figure 1.1 Vehicle Intersection at Unsignalized four-armed Intersection

To extract the PET values, we primarily collected the conflict area dimensions. After that, a grid of size (3.5m*3.5m) equal to the dimensions of the conflict area was drawn in the Auto-cad and exactly overlaid over the collected video by using the Corel Video Studio Pro X11 software. Later onwards, the overlaid video run in the Avidemux 2.6 software with an accuracy of 0.04. The advantage of using this software is that the time for vehicle entry and exit in the conflict zone can be noted precisely. The Video-graphic data is used for the extraction of Post Encroachment Time (PET), and also the number of vehicles involved in the conflict situation along with their categories, direction of the approaching vehicle, the speed of the conflicting vehicles, Speed of the Offending Vehicle, Traffic volume count is extracted.

Both positive and negative values were observed due to the formulation used in computing PET. When the Conflicting vehicle enters the Conflict zone first, then we will get negative PET. When the Offending vehicle exit the conflict zone first then it leads to getting a positive PET value.

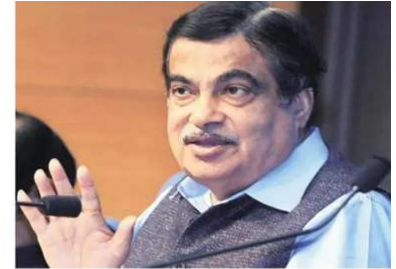
Figure 1.2 Excel Sheet Photos

News Bulletin



Construction steel prices rose up to 117% since Nov 2016: Govt

Prices of steel products used in the infrastructure sector such as wire rods, plates and TMT bars have gone up by 117% in last six years, Steel Minister RCP Singh informed the Parliament. Average price of plates (10 mm) increased to ₹69,852 per tonne (excluding GST) in November as against ₹32,244 per tonne in November 2016, he added.



Construction of 4-lane Jammu-Srinagar highway by December 2023: Gadkari

Union Minister Nitin Gadkari on Wednesday said that the construction of the four-lane national highway (NH-44) from Jammu to Srinagar will be completed by December 2023. "You'll be able to reach Srinagar from Jammu in four hours," he added while addressing a rally in Doda. Gadkari laid the foundation stone of over 24 highway projects worth ₹11,721 crore in J&K.



SpaceX launches NASA mission that will observe black holes

SpaceX has launched NASA's Imaging X-ray Polarimetry Explorer (IXPE) mission. It is NASA's "first" mission dedicated to measuring the polarisation of X-rays from the most extreme and mysterious objects in the universe, supernova remnants, supermassive black holes and dozens of other high-energy objects. IXPE carries three space telescopes with special polarisation-sensitive detectors.



Pune Metro's underground tunnel construction achieves 'breakthrough'

Pune Metro's underground tunnel construction has "achieved a breakthrough" after completing work on the 1.6-km stretch from Agriculture College to Civil Court. A breakthrough is when a tunnel boring machine finishes its scheduled underground stretch and comes out to the shaft's bottom. "This signifies completion of Range Hill-Shivaji Nagar-Civil Court stretch," Pune Metro rail said.



US to have world's 1st 3D-printed housing community: US startup

US-based construction technology startup Mighty Buildings and Palari Group announced they have started developing the world's first community of 3D-printed zero net energy homes in California. The community will have 15 eco-friendly homes, built using Mighty Buildings' 3D-printed panelized Mighty Kit system. Energy will be supplied by solar power, with optional Tesla Powerwall batteries.



UPCOMING EVENT

One Week Short Term Training Program (STTP) On “Soil Exploration, Investigation, Characterization and Ground Improvement”

Probable dates: First week of January 2022 (3rd January 2022 to 07th January 2022)

Venue: Online Platform (G-Meet)

Learning Objectives:

1. To understand the objectives, necessity and scope of sub-soil exploration methods understand the soil investigation report
2. To learn the field and laboratory components of a geotechnical investigation
3. To gain competence in interpretation of the investigation data
4. Describes Soil Improvement and Ground Modification Methods including Application of Geo-synthetics.
5. Recognize the Recent Developments in Mega Infrastructure Projects such as Metro rail, Bullet train, Tunnels, Bridges, Roads, Fly-overs.

Resource Persons: Practicing Professions from Industries, Academicians from IIT and well known Institutes, Research Scholars

Programme outcomes: Participant will be able to

1. Ability to understand the requirement of geotechnical investigations of project, select suitable method of investigation and planning
2. Identify & Analyse the problematic soil and their solution with various advance techniques
3. Competence in the investigation methods including collection of samples, performing laboratory and field tests
4. Focus on recent developments in the area of ground improvement techniques with few case studies.

“Courage doesn’t always roar. Sometimes courage is the quiet voice at the end of the day saying
‘I will try again tomorrow’.”

– Mary Anne Radmacher

ALUMINI CORNER

Hello everyone, I have completed my bachelors' degree from Universal College of Engineering and I am currently working as senior civil site engineer at IRB Infrastructure. I started my career as a civil engineer at LODHA Builders.

I started my job with LODHA builders from June 2017 at Mumbai branch for overall 3 years.

PROJECT: Building structure - Trump tower, Worli (98 storey building).

SCOPE OF WORK:- I was working as a finishing engineer Looking after various other types of finishing related works such as flooring, carpentry, etc.

Later I have started working in IRB Infrastructure from 17th February 2021 As a 'Senior Civil site engineer' at Powai, Mumbai office.

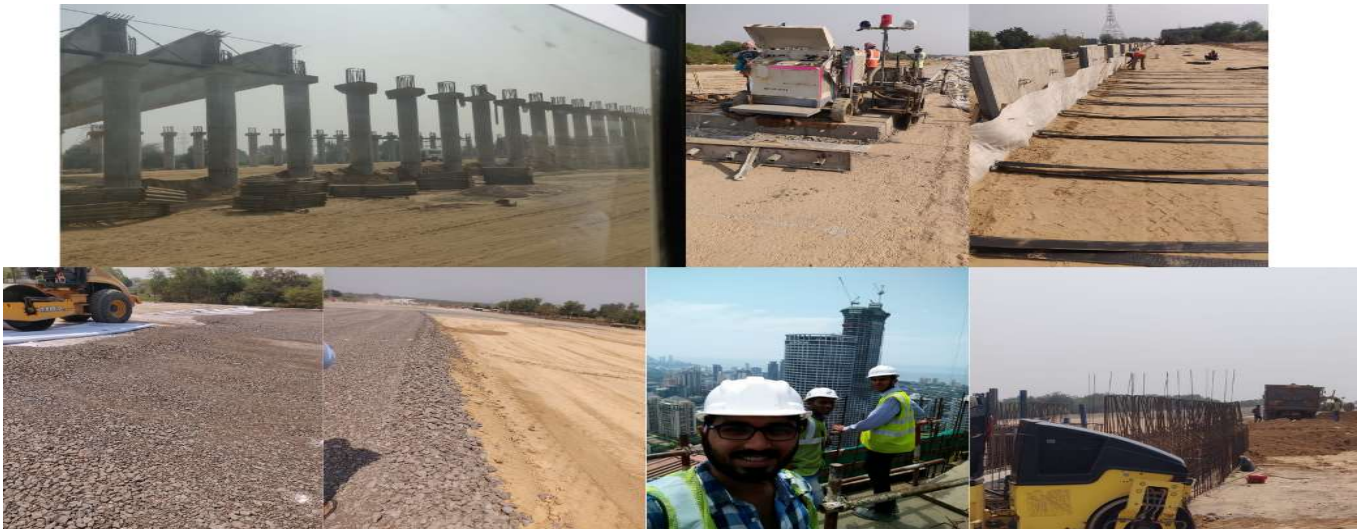
PROJECT:- Delhi- HAM (HYBRID ANNUITY MODEL), Mumbai Bharatmala National Highway

SCOPE OF WORK:- Here I am looking after The section VM-7 which is VODADORA-MUMBAI NATIONAL HIGHWAY.

Supervision of Major structure, Minor structure, Culverts, VUP, VOP, ROB etc.

Also I am majorly involved in Logistics, material ordering, etc. Supervising the quality and quantity of SG, GSB, BITUMIN, AGGREGATE with the help of various instruments which I learned in UCOE campus.

I am glad to be a part of UCOE and it helps me to grow positively in my life. I got maximum practical exposure while pursuing CIVIL engineering from UCOE. Apart from academics, I was the 1st Deputy General Secretary of student council of UoE for consecutive 2 years which I am thankful. I was actively participating in sports like kabbadi, cricket, etc.



-Mr. Nikhil Avhad

B.E. Civil

Batch 1, UCoE

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CANVAS



YASH PATIL
B.E. CIVIL



ARCHIT MANAPETTY
B.E. CIVIL