



Vidya Vikas Education Trust's

Universal College of Engineering

Gujarati Linguistic Minority Institution

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The Benchmark

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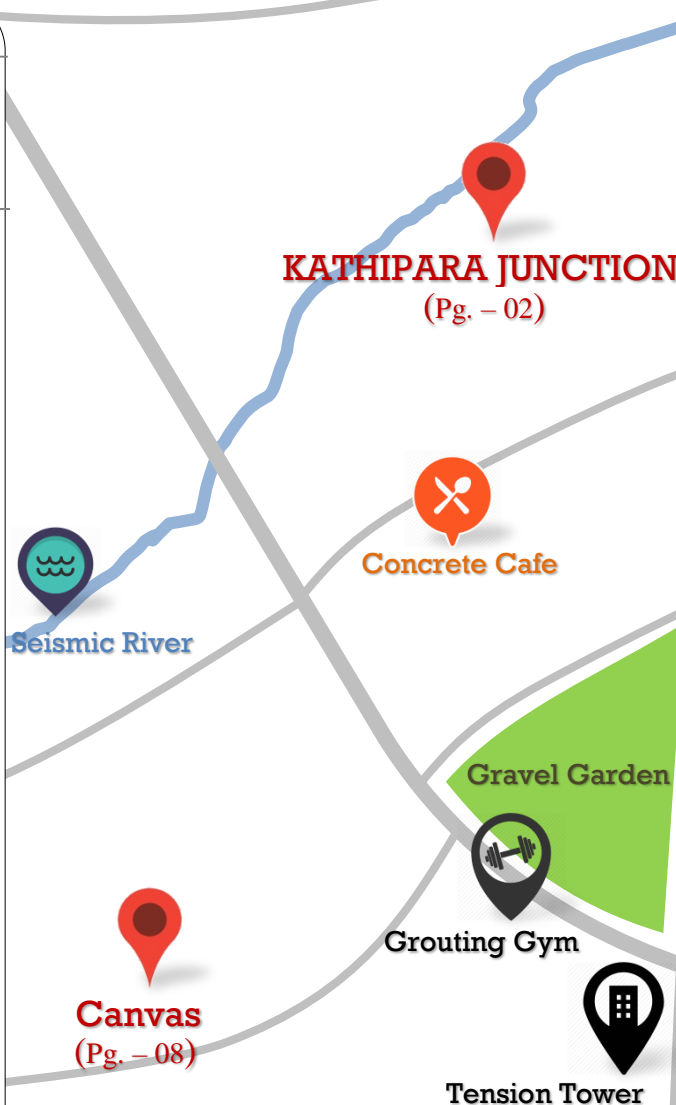
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KATHIPARA JUNCTION
(Pg. - 02)

Concrete Cafe

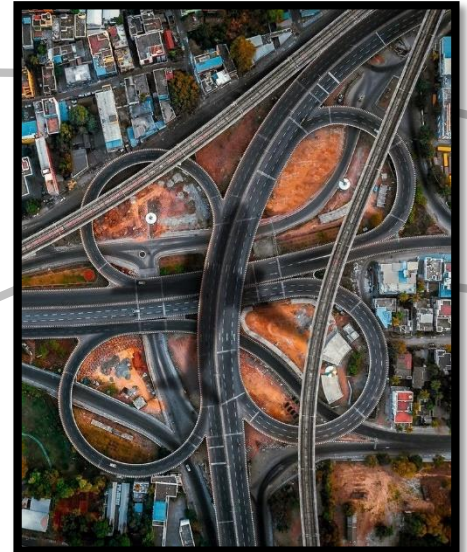
Gravel Garden

Grouting Gym

Tension Tower

Canvas
(Pg. - 08)

Volume
Village



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.

Editor's Desk

We are pleased to present January 2021 edition of benchmark. In this edition you all will find an article on "Kathipara Junction" and other contribution by faculties and students of Department of civil engineering highlighted in the month of December. It also includes news bulletin and departmental activities.

Kathipara Junction

Overview

Chennai's Kathipara Junction, sometimes also called the 'Guindy Flyover', is the largest cloverleaf flyover in Asia. It connects NH 45, Inner Ring Road, Anna Salai and Mount-Poonamallee Road. Incidentally, it is also the starting point of NH 45 - the 'Grand Southern Trunk Road' connecting Chennai and Trichy.

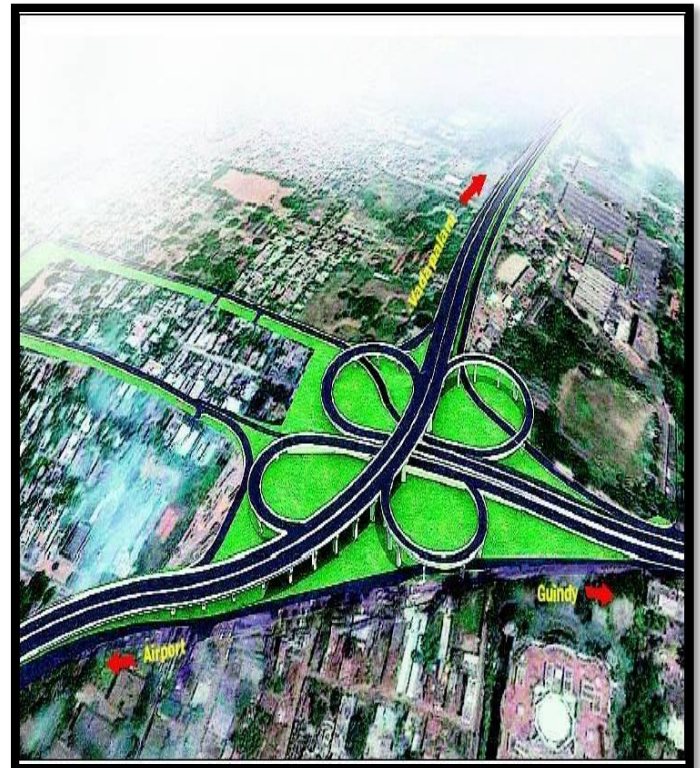
The junction used to be a roundabout with a statue of Jawaharlal Nehru. A cloverleaf grade separator was constructed as part of the NHDP to ease traffic congestion at the junction. The structure was built at an estimated project cost of ₹486 crore (US\$68 million) with an initial deadline of March 2007. It is the first of three grade separators being built on the Inner Ring Road to improve connectivity between the various National Highways radiating from the city, the other two being the one on Koyambedu junction (NH 4) near the Chennai Mofussil Bus Terminus and the one at Padi Junction (NH 205). The main span of the flyover connecting Inner Ring Road and GST Road was opened to traffic on 9 April 2008 and the entire section was opened to the public on 26 October 2008. Landscaping work worth ₹150 lakh (US\$210,000) on the 40,000 sq m area will be taken up after Chennai Metro work is completed.

Originally expected to be completed by 2007, the flyover was finally inaugurated in October 2008 by CM Karunanidhi. However the flyover had another tryst with destiny. Back in 2005, there was also the idea of a Metro rail across Chennai. And that too was supposed to cross Kathipara, on its way to the airport.

On June 29, 2015, after much delay, the first phase of that Metro project, with its dual rail-lines towering over the two-storey flyover (making quite a giddy impression on those who look at it for the first time) will be officially opened by CM Jayalalithaa, via video conferencing. Incidentally, the destiny of the Nehru statue is still under some cloud. It was supposed to be re-installed underneath the flyover after landscaping. After ten years, the Kathipara Junction can finally be said to be 'ready'. Using Google Maps and the 'Historical Plugin', we can go back in time, and through these six satellite snapshots have a look at the growth of this Chennai junction. The images show the junction as it originally was, the building of the cloverleaf flyover and then the construction of the two Metro lines, one after the other.

Photos

In 2005, it was decided to develop the junction, which originally featured a round-about with a statue of Pandit Nehru in the center. This is was due to its other important feature - 30-minute long traffic jams. The idea was to build a grade-separator - a flyover with two levels, allowing all four sides to cross one another without any signals.



DID YOU KNOW?

Science day in Switzerland is dedicated to Ex-Indian President, APJ Abdul Kalam

The father of India's missile programme had visited Switzerland back in 2006. Upon his arrival, Switzerland declared May 26th as Science Day

To know more about Kathipara Junction, Scan the QR Code



Page 03: - Mechanically Stabilized Earth (MSE)

- Mechanically Stabilized Earth using Plaxis 2D

Mechanically Stabilized Earth (MSE) wall system is retention system used for highway design. In conventional system, cast in place concrete structure is used that cannot accommodate significant differential settlement especially with poor sub-grade condition. MSE wall systems are economical earth retaining structure which can tolerate more settlement over traditional retaining wall systems. The comparative study between MSE Wall and conventional retaining wall is done using Geotechnical software 'PLAXIS 2 D'. The simulation models of conventional and MSE retaining wall subjected to condition of no surcharge as well as variable surcharge both in at rest and active state are created and analyzed using PLAXIS 2 D Software. The comparative Study of models of both types is done by creating and studying total stress, effective stress, deformed shape, variation in stress at different point, shear force and bending moment.

The performance of conventional and MSE wall is evaluated to identify their suitability for the purpose of retaining soil in location having differential settlement. The result obtained from simulation are also supported with manual calculation for the above said condition. The aim of the study is to predict the behavior of both the type of retaining walls under different loading condition which will further help to choose the appropriate type of wall among the two walls.

case considered for analysis

SRNO	ACTIV E	REST	ACTIVE WITH SURCA HRGE 25KN/ m2	ACTIVE WITH SURCA HRGE 50KN/ m2	ACTIVE WITH SURCA HRGE 100KN/ m2	REST WITH SURCA HRGE 25KN/ m2	REST WITH SURCA HRGE 50KN/ m2	REST WITH SURCA HRGE 100KN/ m2
Height of soil retained in m	3	3	3	3	3	3	3	3
Height of soil retained In m	6	6	6	6	6	6	6	6
Height of soil retained in m	9	9	9	9	9	9	9	9

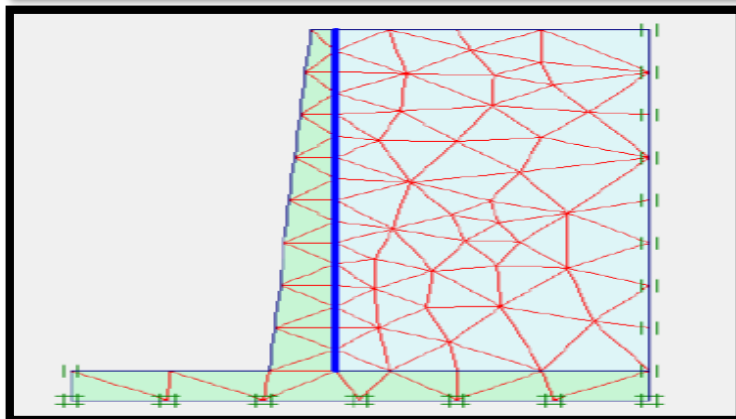


Figure 1 mesh generated in Plaxis

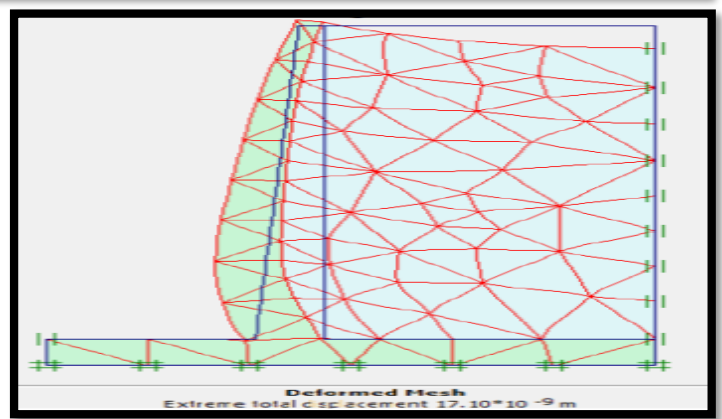


Figure 2 Deformed mesh

“Engineers ... are not mere technicians and should not approve or lend their name to any project that does not promise to be beneficent to man and the advancement of civilization.”

- John Fowler

Retaining walls are the structures constructed to resist the active earth pressure exerted by backfill soil. These types of walls are used in supporting of embankments in plain as well as hilly areas. Different types of retaining walls have been used since ages such as gravity retaining walls made up of stone and brick masonry, cantilever retaining walls made up of RCC. Nowadays these walls are made of mechanically stabilized earth (MSE) backfill which is reinforced with geo-grid layers. The theoretical analysis of above types of walls deals with calculating the effective stress, displacements etc.

In present work the conventional retaining walls and MSE walls are designed and analyzed for the rest and active condition having zero and variable surcharge using PLAXIS 2 D a FEM based computational tool to access and evaluate deformation., stability in terms of maximum deflection. For the above analysis 24 cases were studied having above said condition.

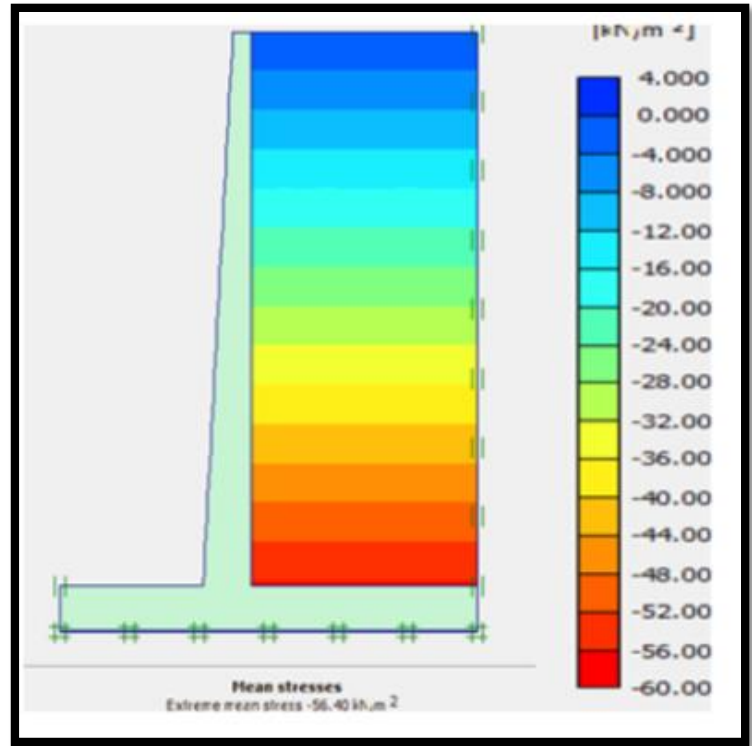


Figure 4 mean stress

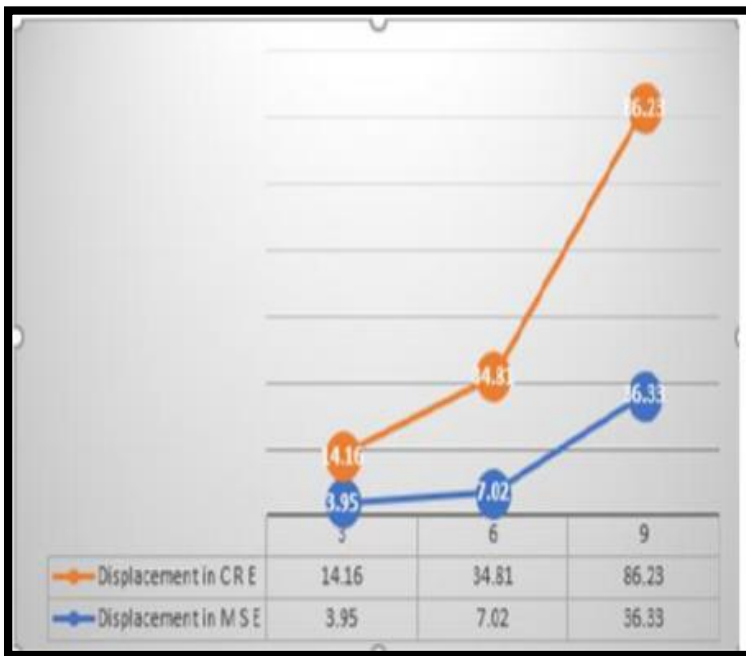


Figure 3 displacement comparisons

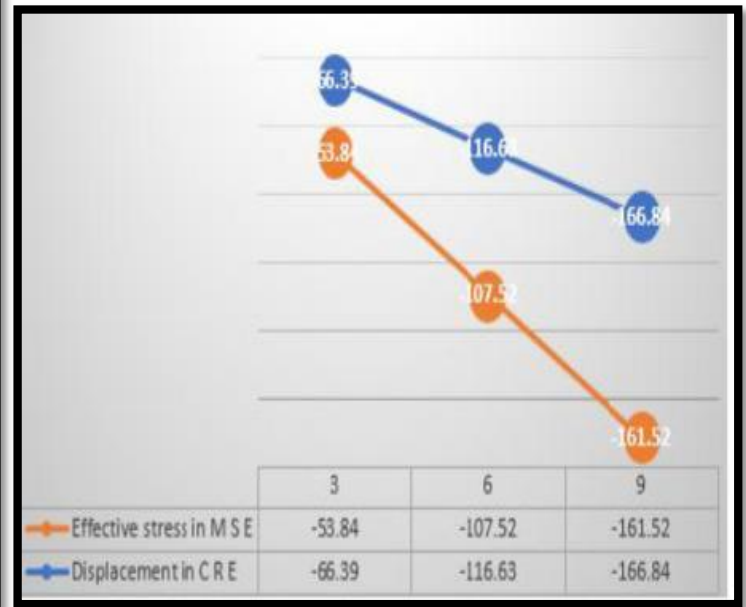


Figure 2 Effective stress comparison

-Mr. Naved Quereshi
Asst. Professor UCoE



Scratch Your Head!!

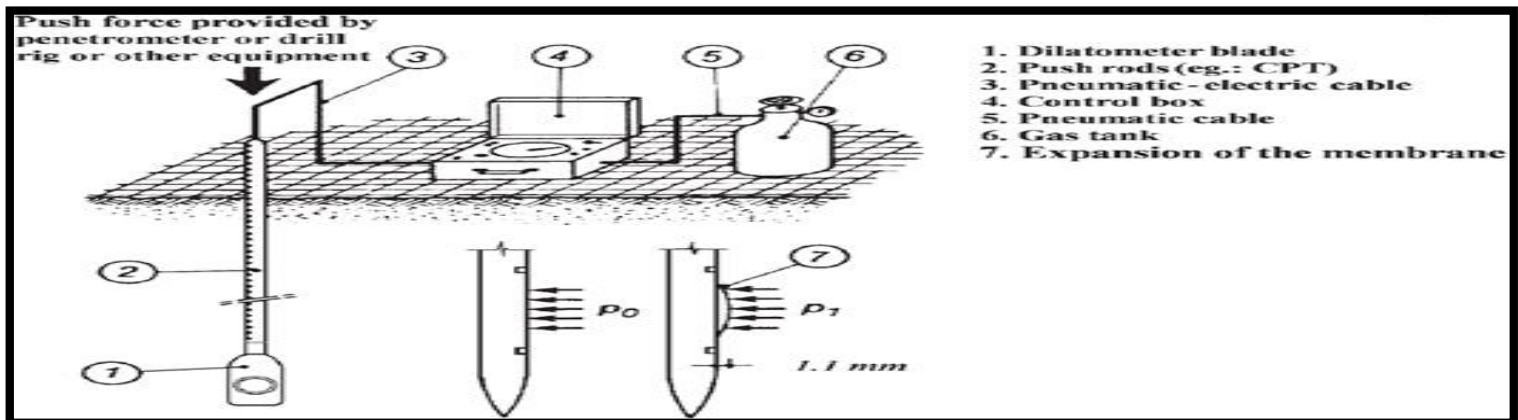
1) What one was red is black instead?

Ans :- _____

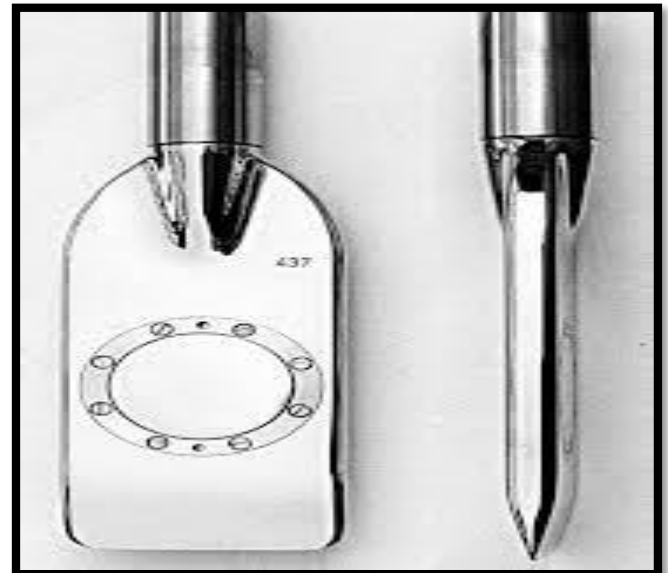
Page 05: - Soil Investigations: Flat Dilatometer Test (DMT)

The flat dilatometer is a stainless steel blade having a flat, circular steel membrane mounted flush on one side. The blade is connected to a control unit on the ground surface by a pneumatic-electrical tube (transmitting gas pressure and electrical continuity) running through the insertion rods. A gas tank, connected to the control unit by a pneumatic cable, supplies the gas pressure required to expand the membrane. The control unit is equipped with a pressure regulator, pressure gauge(s), an audio-visual signal and vent valves.

The blade is advanced into the ground using common field equipment, i.e. push rigs normally used for the cone penetration test (CPT) or drill rigs. Push rods are used to transfer the thrust from the insertion rig to the blade. The test starts by inserting the dilatometer into the ground. Soon after penetration, by use of the control unit, the operator inflates the membrane and takes, in about 1 minute, two readings: 1) the A-pressure, required to just begin to move the membrane against the soil ("lift-off") 2) the B-pressure, required to move the centre of the membrane 1.1 mm against the soil. A third reading C ("closing pressure") can also optionally be taken by slowly deflating the membrane soon after B is reached.



The blade is then advanced into the ground of one depth increment (typically 20 cm) and the procedure for taking A, B readings repeated at each depth. The pressure readings A, B are then corrected by the values DA , DB determined by calibration to take into account the membrane stiffness and converted into p_0 , p_1 . The field of application of the DMT is very wide, ranging from extremely soft soils to hard soils/soft rocks. The DMT is suitable for sands, silts and clays, where the grains are small compared to the membrane diameter (60 mm). It is not suitable for gravels, however the blade is robust enough to cross gravel layers of about 0.5 m thickness. Due to the balance of zero pressure measurement method (null method), the DMT readings are highly accurate even in extremely soft - nearly liquid soils. On the other hand the blade is very robust (can safely withstand up to 250 kN of pushing force) and can penetrate even soft rocks.



DID YOU KNOW?

Bandra Worli Sealink has steel wires equal to the earth's circumference

It took a total of 2,57,00,000 man hours for completion and also weighs as much as 50,000 African elephants. A true engineering and architectural marvel.

Clays can be tested from $c_u = 2-4$ kPa up to 1000 kPa. The range for moduli M is from 0.4 MPa up to 400 MPa. The field of application of the Flat Dilatometer Test DMT is very wide 1) Accurate settlement prediction of shallow foundations 2) Compaction control 3) Sensing the effects of pile installations 4) Liquefiability of sands 5) To verify if a slope contains slip surfaces 6) Axially loaded piles in cohesive soils 7) Laterally loaded piles 8) Pavement subgrade compaction control 9) Coefficient of consolidation and permeability of clays 10) Phreatic level in sands 11) Help in selecting FEM input parameters.

-Mr. Sachin Pawar
Asst. Professor UCoE



❖ *Webinar Taken by Faculty in Dec 2020*

Sr.no	Date	Name of the Faculty	Webinar Name
1	16/12/2020	Mr. Yuvraj Chavda	Webinar series On Real Time Structural Health Monitoring System at Dr. Baliram Hiray College Of Architecture

CONGRAJULATION FOR YOUR SELECTION

Congratulations on your well-deserved success.” We wish you all lots of success and happiness in your selection in PINCLICK as ASSOCIATE PROPERTY ADVISOR with a package of 4.8 lpa. Best all luck to Prashant Parmeshwar Ingale, Prajwal Jathar, Maharshi Trivedi, Yash Kamalakar Patil. You did great things here in UCoE, and you’ll do great things there in Pinclick. Congratulations!



Mr. Prajwal Jathar
B.E. CIVIL



Mr. Maharshi Trivedi
B.E. CIVIL



Mr. Prashant Parmeshwar Ingale
B.E. CIVIL



Mr. Yash Kamalakar Patil
B.E. CIVIL

Scratch Your Head!!

- 2) I am a protector.
I sit on a bridge.
One person can see right through me,
While others wonder what I hide.

Ans :- _____

News Bulletin

➤ **PM Modi lays foundation stone for housing projects in 6 states**

PM Narendra Modi on Friday virtually laid the foundation stone of Light House Projects (LHPs) under Global Housing Technology Challenge-India in six states. Houses being built under the project will reportedly take less time to build, will be resilient, affordable and comfortable. LHPs will be constructed at Indore, Rajkot, Chennai, Ranchi, Agartala and Lucknow.



➤ **ISRO to open Regional Academic Centre for Space at IIT (BHU)**

The Indian Institute of Technology (BHU) Varanasi will soon have a Regional Academic Centre for Space (RAC-S) by the Indian Space Research Organisation (ISRO) at its campus. The centre will carry advanced research in the Indian space programme, the institute informed in an official release. It will facilitate short and long-term projects to propel the culture of research and development.



➤ **New COVID-19 strain doesn't cause more severe illness than others**

A matched study by Public Health England said the new variant of coronavirus, which was found in UK, doesn't appear to cause more severe illness than other variants. The researchers compared 1,769 people infected with the new variant with 1,769 who had what they described as "wild-type" virus. However, the study added that the new variant can spread more rapidly.



➤ **Pfizer vaccine first to receive emergency validation from WHO**

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➤ **Who needs to register and who doesn't for coronavirus vaccine?**

The government has said there's no need for self-registration by healthcare and frontline workers for coronavirus vaccination as their data will be taken from bulk database on Co-WIN Vaccine Delivery management system. For around 27 crore people, part of the prioritised group that includes people aged 50 and above, there'll be provisions of registration or editing of data, it added.



"One of the hardest things in the world is to be right and not hurt other people with it.."
-Dallas Willard

Self Confidence: First Step to Success

This world, in which we live, is a very competitive one. It is popularly described as a rat race, full of competent people and the fittest of them survives. Success is not a cake walk. One has to face lots of hard ships and obstacles to taste success. The most important aspect in achieving success is self confidence. However, people are ambitious but not confident enough to go for it. Infact, most of them don't know how to go about it or are terrified to take risks in their lives.

Self confidence is not something which can't be achieved in a day or two. Let us understand that we are not born with it. It's the situation we face, motivation from others and self motivation that make us truly confident. Hence those of who feel that we lack confidence, have no reason to be upset.

There are 3 kinds of people. One, who dream big but do not have any idea how to pursue it. The second, who are over confident and end up ruining their opportunities Lastly, the ones who are confident and have talent. This segment knows what they want and how to move further

For attaining a goal, it is important to strive for it and work on the strategies relentlessly. It is necessary to make proper planning and follow up. We will come across ups and downs but should not lose focus and give up. Work hard throughout and be focused until the desired result is achieved.

Now, the question arises as to what are the plans/strategies. At the outset, one has to be disciplined. It is not easy as it sounds, but, requires lot of commitment. However, it is not impossible. Take good care of physique as it is very important when it comes to self confidence Healthy food habits and proper sleep are very much essential. Since hard work is involved, it is imperative that we do not lose hope or be disheartened. Knowing who you are and what your strengths are, is an area that requires your utmost focus. However, it depends on how we perceive it. Everybody has flaws, but we have to shine through them. Don't lose hope. be patient, take care of oneself and work hard. The puzzle will fall in place.

-Ms.Kalpita Chafekar
T.E. CIVIL

Upcoming Events

Let's join with ACES to Celebrate a NEW YEAR : -

*Time ticks by as life looks anew,
Leaving reminiscences of everything.
The new year gently making its way.
Each new day and each new year,
Like the sun that brightens every morning,
And the new blooms that adorn.
Brimming with hopes and aspirations,
Bringing us close to our destinations,
A chance for a new beginning,
Or maybe to finish what is left undone.
Wishing you all a very HAPPY NEW YEAR 2021.*



ANSWERS to "Scratch Your Head"

1) Matchstick 2) Sunglasses