



Vidya Vikas Education Trust's

Universal College of Engineering

Gujarati Linguistic Minority Institution

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The Benchmark

Issue 020: March 2020 Edition



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Golden Gate Bridge
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Concrete Cafe

Gravel Garden

Grouting Gym

Tension Tower

Canvas
(Pg. - 10-12)

Seismic River

Volume Village

Editor's Desk

We are pleased to present March 2020 Edition of Benchmark. This edition focus on various campaign going around cities as well as presents you with achievements of students as well as faculties under civil department, other contributions of students & faculties of Department of Civil Engineering in the month of December are also highlighted.

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.

Golden Gate Bridge

Overview

- The **Golden Gate Bridge** is a suspension bridge spanning the Golden Gate, the one-mile-wide (1.6 km) strait connecting San Francisco Bay and the Pacific Ocean. The structure links the U.S. city of San Francisco, California—the northern tip of the San Francisco Peninsula—to Marin County, carrying both U.S. Route 101 and California State Route 1 across the strait. The bridge is one of the most internationally recognized symbols of San Francisco, California, and the United States. It was initially designed by engineer Joseph Strauss in 1917
- Many wanted to build a bridge to connect San Francisco to Marin County. San Francisco was the largest American city still served primarily by ferry boats. Because it did not have a permanent link with communities around the bay, the city's growth rate was below the national average.
- Many experts said that a bridge could not be built across the 2,000-metre strait, which had strong, swirling tides and currents, with water 113 m deep at the center of the channel, and frequent strong winds.
- The color of the bridge is officially an orange vermillion called international orange. Construction began on January 5, 1933. The project cost more than \$35 million and was completed ahead of schedule and \$1.3 million under budget. The total length of the Golden Gate Bridge from abutment to abutment is 2,737 m. The Golden Gate Bridge's clearance above high water averages 67 m while its towers, at 227 m above the water, were the world's tallest on a suspension bridge until 1993 when it was surpassed by the Mezcala Bridge, in Mexico. The project was finished and opened on May 27, 1937.
- It has been declared one of the Wonders of the Modern World by the American Society of Civil Engineers. In 1999, it was ranked fifth on the List of America's Favourite Architecture by the American Institute of Architects.
- Until 1964, the Golden Gate Bridge had the longest suspension bridge main span in the world, at 4,200 feet (1,300 m). Since 1964 its main span length has been surpassed by fifteen bridges; it now has the second-longest main span in the United States, after the Verrazzano-Narrows Bridge in New York City. The total length of the Golden Gate Bridge from abutment to abutment is 8,981 feet (2,737 m).

Photos



The initial toll for the bridge was 50 cents each way—roughly equivalent to an \$18.00 roundtrip today—a hefty price to pay in the midst of the Great Depression. Today, Golden Gate Bridge tolls are collected in one direction



DID YOU KNOW?

Builders removed about 200,000 tons of rock to create ancient Indian temple called Kailasa. The entire temple was carved out of a single rock. Carvers started at the top.

To know more about Golden Gate Bridge, Scan the QR Code



Page 03:- Delhi Odd Even Campaign

The Delhi High Court directed the Centre and State governments to come up with comprehensive action plans to put a check on the capital city's "alarming" pollution rate, saying living in Delhi is like "living in a gas chamber".

A day after this, the Kejriwal-led government declared the odd-even vehicle rule with the hope it would lower the number of vehicles hitting the road per day, eventually bringing down the city's air pollution rate.

The odd even rule was implemented in Delhi first in 2016 from January 1-15 and April 15-30. Under the 'odd-even scheme', vehicles with odd registration number will be allowed on odd days. And on even days, only vehicles with even number would be allowed the scheme was implemented to reduce the pollution and smog in Delhi.

The AAP cabinet announced private vehicles will be allowed to run across the city based on their registration numbers. For example, if a vehicle's registration number ends with an odd digit, it will be allowed on the road on January 1, while that ending with an even number can be driven on the second, and so on. This step has been taken as a measure to bring down and control pollution in Delhi.

This system was implemented in Beijing in 2008 just before the summer Olympics. While the rule was initially said to be temporary, it turned out to be so effective the government made it permanent.



Similar road-rationing rules are imposed in many places around the world like Paris, Mexico and Bogota to curb road jams and pollution.

Mexico City started this rule as Hoy no Circula scheme (No Circulating Day) in 1989. The trial implementation during the winter months of 1989 resulted in a 20% reduction in daily vehicles in circulation within the target area, an increase in vehicle speeds, and drop in fuel consumption and 6.6% increase in subway ridership.

Initially, the scheme reduced pollution 11%. But, once the rule became permanent, people purchased more vehicles with alternate plates. There was no improvement in long-term air quality levels during any hour of the day or the week. Pollutions levels increased during the weekends and hours of the day when the rule did not apply. In Paris, similar restrictions were imposed for one day in 1997 and in March 2014. The experiment reduced pollution levels. Beijing implemented a temporary scheme before the 2008 Summer Olympics, cleaning the air and relieving traffic congestion.

In Sao Paulo, the scheme was initially implemented in 1995, as an emergency measure to curb air pollution. An experimental trial of six month showed 2% (morning) and 5% (evening) reduction in peak-period vehicular volumes. The initial experiment was successful in reducing pollution levels, especially carbon monoxide. The odd-even scheme known as Rodizio, was made permanent in 1997. The scheme came into force for the third time on 4 Nov 2019, after the success of first two times. The results were visible from the very first day as people of Delhi welcomed the move.

Scratch Your Head !!

1) In a mortar, the binding material is?

- ❖ Cement
- ❖ Sand
- ❖ Surkhi
- ❖ Cinder

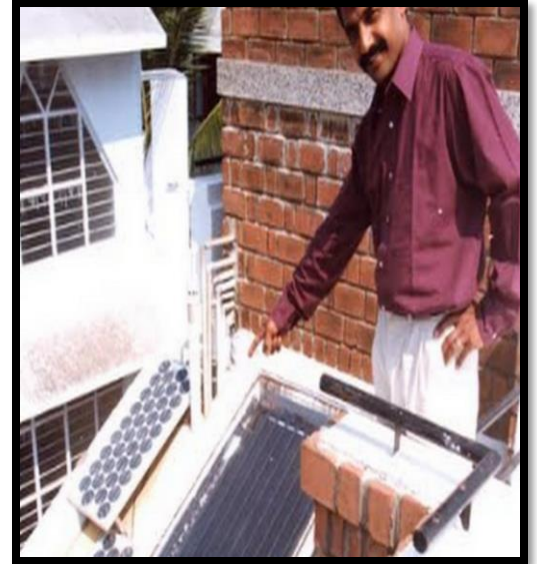
- Mr. Asir Khan
Asst. Professor UCoE



Page 04:- The Real Hero – The Rain Man of Bengaluru!!!

This is a story of sustainable house built by someone somewhere — this doesn't imply that it is insignificant or inconsequential, but rather that anyone anywhere can achieve it and within modest costs. Anyone can emulate these ideas of basic ways of busting heat, reducing resource needs and maximising comforts with minimum. Probably, this story of a Bangalore scientist may provide many of us with answers to face the Global warming.

A government employee in Bangalore marketing solar water heaters, way back in the 80s, felt guilty for not practicing what he preaches. "Why can't charity begin at home?" he asked himself and with this conviction Shivkumar, a scientist with Karnataka State Council for Science and Technology and a qualified mechanical engineer, built his home keeping environmental management at the core. On a plot of 60X40 feet at Vijaynagar in Bangalore, Shivkumar built his house 'Sourabha' measuring 2,100 square feet for a family of four in 1995 comprising three bedrooms.



He used local materials like bricks for wall, stone for flooring and concrete as well as tile for roofing. The unplastered un-painted brick not only remains inexpensive building material but also provides an earthy feel. For environment management without dependence on mechanised services, many commonsensical strategies are applied at nearly no additional costs. The response to busting heat ingress began at the planning stage itself by providing living areas in east and north, placing toilet, store and stairs kind of functions in the west to act as buffer space and insulate against harsh sun from west. While most of the external wall surfaces are exposed or kept as un-plastered brick surfaces without painting, the west facade is plastered and painted white for reflectivity and reduced conductivity of sun. By construction, it relies on thermal mass of the brick walls and air cavity within. Walls constructed in the rat trap bond style popularised by Trivandrum-based British architect, Laurie Baker reduce the volume of brick consumption by about 20%, for the same load bearing capacity. The air cavity in between brick also provides thermal insulation. Roof is painted white to repel sun and induce over six degrees of temperature reduction. As the house is split on two floors the upper floor keeps the ground protected through the day and at night sleeping activities on upper floor benefit from night cooling.

Vegetation is an integral aspect of heat busting strategy. Tall and dense trees such as Neem and Copper pod are planted all around, especially in the west, to shelter from external vagaries. Plumiera and shrubs adorn 1600 square feet of roof area while insulating spaces below. The house remains practically invisible nestled within greenery from the roadside.



The end result of these is that house not only has no air conditioners but also has just about two fans in two bed rooms for occasional use. Earthworm composting takes care of organic waste disposal as well as provides nourishment to plants. Water harvesting is the hallmark of this house. Total of 45,000 litres of rain water is harvested in different levels for gravitational advantage. Roof itself holds 5000 litres; sump below ground holds 25,000 litres, garage 10,000 and overhead tank 5000 litres. Additionally grey water, especially washing machine water is treated and recycled for flushing. Treatment is fairly simple by way of aeration through open gutter channel and then filtration through active carbon bed. Similarly kitchen sink water is also used for gardening through a diverter valve. These ensures total self-sufficiency for the water needs. Day lighting is optimised by providing small punctures in roof as skylights to illuminate the house spaces naturally through the day without need for artificial light. For lighting LED fixtures are used. The electricity load for television, fridge, fan and water heating is practically taken care of by three photo voltaic panels of 35 watts each and solar water heaters.

"If you salute your duty, you need not salute anybody. But if you pollute your duty, you have to salute everybody."

- A.P.J. Abdul Kalam

These are also integrated as roof elements themselves by placing them at 23 degrees in South as toilet roof. Effective summation of all these is a monthly bill of meagre 15 rupees for sewerage, 5 kg (one third cylinder) for cooking and only 80 units (about two hundred rupees) for electricity. If there is a 'will' there is surely a way, but in this consumerist society, may be a 'bill' may lead the way. Thank you, Mr Shivkumar from Bangalore, for leading the path.



- Mrs. Mitali Poojari
Asst. Professor UCoE



P	L	J	I	D	X	M	Y	W	T	W	Q
C	D	C	C	Z	S	W	M	G	H	X	A
A	S	S	E	O	O	X	K	S	O	C	C
N	S	Z	J	M	N	L	I	A	X	L	P
T	E	K	O	S	E	C	C	N	B	T	A
I	R	A	G	Q	N	N	R	D	N	W	H
L	T	X	Y	A	Z	Q	T	E	A	A	A
E	T	E	P	M	L	S	M	A	T	T	B
V	U	C	S	A	V	T	G	O	G	E	B
E	B	R	U	E	U	P	Z	G	Q	R	Q
R	O	O	M	B	E	D	Q	R	U	X	D
G	B	F	A	U	W	M	F	I	Y	E	B

HINTS!!!!

1. Abutment
2. Beam
3. Buttress
4. Cement
5. Force
6. Sand
7. Water
8. Cantilever
9. Concrete
10. Gypsum

Scratch Your Head !!

2) *Rails are bent to correct curvature, if the degree of curve is more than?*

- ❖ 1 degree
- ❖ 2 degree
- ❖ 3 degree
- ❖ 4 degree

Page 06:- Survey Industrial Visit

Place: Monteria Resort, Khopoli.

The Department of Civil Engineering had organised four days industrial visit for their survey project for second year students at Vinegaon, Khopoli. Survey visit was conducted in two batches where in the first batch SE B div visited Monteria, Khopoli from 22nd January to 25th January 2020 and SE A div visited from 27th January to 30th January 2020. The survey was performed in an open field nearby the resort which was found to be very convenient for the students in terms of travelling and carrying instruments and tools for the survey.



On the day of departure, as soon as the students reached the venue, they were allotted their rooms followed by the first survey practical which started at 11.00 am sharp. The class was divided into groups of six students each and the survey experiments were scheduled as per the groups, where batches from S1 to

S6 (Around 70 students) of SE-A were managed by Mr. Asir Khan, Ms. Swapnali Onkar and Mr. Sagar Butle and the batches from G1 to G7 (around 68 students) of SE-B were managed by Mr. Yuvraj Chawda, Mr. Nikhil Sontakke and Ms. Shilpa Patil. Batches had to perform Block Contouring, Profile Levelling and Radial Contouring. The block contouring was performed in a 100m x 80m area, whereas profile levelling was performed at a length of about 500m.

Further, the students were told to freshen up and accommodate in the conference room of the resort where a workshop for the students was hosted by Dr. J. B. Patil, Campus director of Universal College of Engineering. Dr. Patil interacted with the students and provided them with a small activity based on Smart City. The students planned a smart city discussed about its varied features with other groups and the faculties as well. Dr. Patil shared some motivational videos with the class. Succeeding this, the students had their dinner and returned to their respective rooms.



"You cannot change your future, but you can change your habit, and surely your habits will change your future."

-A.P.J. Abdul Kalam

During block contouring, the area was turned into a grid and all its points were plotted. Commonly used size of square 5 m x 5 m was made. Levels of all grid points were established by levelling. The same was plotted on a drawing sheet. Reduced levels of grid points marked and contour lines were drawn by interpolation.

The S1 and S2 groups were allotted with Block Contouring on the first day, Profile Levelling on the second day and Radial Contouring on the third day. S3 and S4 performed Profile Levelling on the first day, Radial Contouring on the second day and Block Contouring on the last day. S5 and S6 batches performed Radial Contouring, Block Contouring and Profile Levelling on the first, second and the last day respectively. Whereas, G1 and G5 Profile Levelling on the first day, Radial Contouring on the second day and Block Contouring on the third day. G2, G6 and G7 had to perform Radial Contouring on the first day, Block Contouring on the second and Profile Levelling on the third day. The batch, G3 and G4 performed Block Contouring, Profile Levelling and Radial Contouring on the first, second and the third day respectively.

In profile levelling, the levelling instrument is placed at a suitable position and after temporary adjustments, the staff reading is taken. The first staff reading of any set up is entered in a Back-Sight column, and last is the Fore-Sight column. The other reading is entered in the Intermediate-Sight column. The fore bearing and back bearing of each line was measured and entered in the level book. Temporary benchmarks (TBM) should be



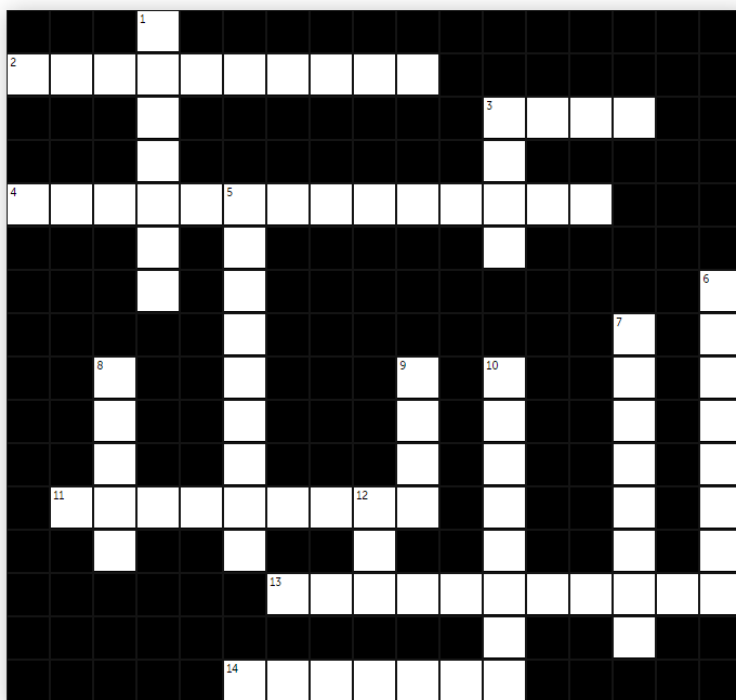
placed at some chainage interval at the root of the tree or permanent points at the end of day work. Fly levelling was done to connect this TBM to the starting point of the day work. At the point of fly levelling, all the TBM's are also connected in order to detect error. The next day work is started from the TBM placed on the previous day. For Radial Contouring, a single point in the centre can command the whole area. Radial lines are laid out from the common centre by theodolite or compass and their positions are fixed up by horizontal angles and bearings. TBM's are first established at the centre and near the ends of the radial lines. The contour points are then located and marked on these lines as explained above and their positions

“Climbing to the top demands strength, whether it is to the top of Mount Everest or top of your career.”

-A.P.J. Abdul Kalam

are determined by measuring their distances along the radial lines. They are then plotted on the plan and the contours are drawn by joining all the corresponding points.

On the third day, the surveys started early in the morning and the same schedule was continued with the first batches to perform with. After the evening high tea, the students accommodated near the turf for some adventure sports organized by the resort for the students, where they were taught about safety, the movements and balancing their body during the different obstacles in the task. Students enjoyed their unusual and unique experience. They expressed their gratitude towards their teachers and thanked them for organizing the visit. The next day i.e. on the last day, after breakfast, everyone gathered near the reception for a group photo as well as for the departure from the resort.



ACROSS

- 2 the act of lengthening something [10]
- 3 a device that moves fluid or gas by pressure or suction [4]
- 4 the ratio of the breaking stress of a structure to the estimated maximum stress in ordinary use [14]
- 11 the property of relative size or extent [9]
- 13 an increase in the density of something [11]
- 14 having little elasticity [7]

DOWN

- 1 the tendency of something to stay in rest or motion [7]
- 3 a support for two adjacent bridge spans [4]
- 5 lake used to store water for community use [9]
- 6 an alloy of iron containing so much carbon that it is brittle and so cannot be wrought but must be shaped by casting [8]
- 7 the center of mass of an object of uniform density [8]
- 8 a deformation of an object in which parallel planes shift [5]

Scratch Your Head !!

3) Quartzite is a which type of rock ?

- ❖ *Metamorphic Rock*
- ❖ *Calcareous Rock*
- ❖ *Argillaceous Rock*
- ❖ *Silicious Rock*

Page 09:- Lavasa Industrial Visit

Lavasa site visit was a helpful educational tour, conducted by the Department of Civil Engineering for the students of fourth year Civil Engineering of Universal College Of Engineering. The purpose of this visit was to give the students an idea of Project Planning and Sewage Treatment Plant and was under the guidance of Ms. Swapnali Onkar, Mr. Sagar Butle, Mr. Swapnil Wani and Mr. Nikhil Sontake.



India's first planned hill city is being developed by Lavasa Corporation Limited, located in the western region of India in the picturesque landscape of the Sahayadri Mountains, it is set amidst 7 hills and 60 km. of lakefront. Artist impression of Lavasa lake line Master plan for Lavasa developed by internationally renowned design consultant HOK, USA is based on the vision "People living in harmony with nature". It is broadly based on a town planning principle known as the "transect model". The principle for sustainable growth at Lavasa adopts a two-pronged strategy; protecting the existing natural habitat as it is and further enhancing the habitat through hydro-seeding, gemmating, mass plantations and beautification of ravines.

The city offers diverse work possibilities viz. IT and biotech industry, the world of art, fashion and animation. Lavasa is planned for a permanent population of around 3 lakh residents. It is the first Indian city being developed using Geographical Information System (GIS). Lavasa when completely built will have 5 towns - Dasve, Mugaon, Dhamanohol, Sakhari-Wadavali and the Central Business District



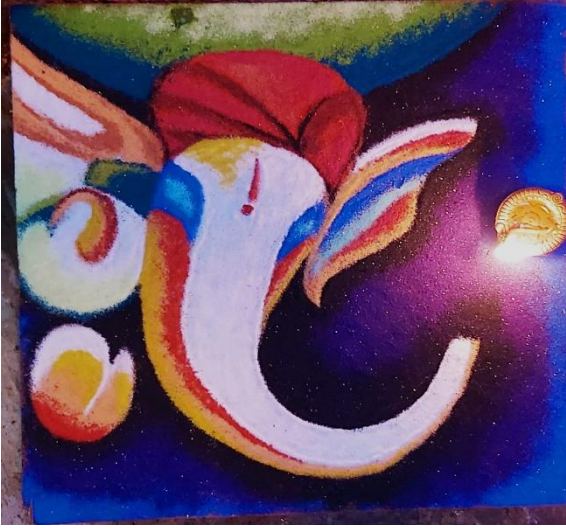
(CBD).

The department of Waste Water Management is responsible for collecting, managing and treating wastewater generated throughout the Lavasa community. Sewage Treatment Plant is designed to treat waste water based on the principles of Extended Aeration Technology. It ensures 00% reuse of treated sewage.

Cavity walls are used for the construction of the infrastructure. Cavity wall is constructed with two separate walls for single wall purpose with some cavity between them. It doesn't require any footings under it, just a strong concrete base is provided on which cavity wall is constructed centrally. Lavasa uses Gigabit Passive Optical Network (GPON) technology, providing speed of 100 Mbps wherein a single strand of fibre reaches every premise to decrease the amount of wires used in a house.

Lavasa work started in 2002 and stopped around 2011. The many reasons for the failure of Lavasa are natural damage, land acquisition and legal issues as well as political involvement.

CANVAS



- Rahul Patil
T.E. Civil



पाणी पिताना त्याला जिवघेणा ठसका लागला सगळे म्हणाले "कोणीतरी तुझी जाम आठवण काढतय" आणि त्याला 'ती' आठवली जिला तो आपण विसरलोय असं समजत होता... तिने आठवण काढली असेल तर?... या विचाराने तो ठसक्याने कासावीस होत असतानाही सुखावला...

पण पुढच्या क्षणी तो सावध झाला म्हणाला मी नाही तिची आठवण काढणार

माझ्या लक्षात आहे...

तिला ठसका सोसत नाही.....



- Rahul Patil
T.E. Civil



- Rahul Patil
T.E. Civil

ACHIEVEMENTS

CONGRULATIONS!!!

For successful Placement in **upGrad** as Academic Counselors with a package of 10 LPA



Hardik Gada
Civil Engineering



Dhruvesh Makwana
Civil Engineering

Utkarsh is one of the state level competition for NSS volunteers. Selection was based on various competitions like singing, drawing, dancing, street play performance, instrumental player etc. a blend of cultural and creative abilities is to be showcased. Students were selected on the basis of over all development.

Congratulation Ms. Suvarna Jadhav from T.E. Civil- A to get selected for UTKARSH..

Mr. Pritesh Mewada and Ms. Sakshi Singh won the first price in project Under the Guidance of **Mr. Yuvraj Chawda** under The Institution of Engineers (IEI) Belapur centre on **28th February, 2020**. The project was on Real Time Slope Failure Prediction System.



ANSWERS to "Scratch Your Head"

- 1) Cement
- 2) 4 Degree
- 3) Metamorphic Rock

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