Vidya Vikas Education Trust's
Universal College of Engineering
Near Bhajansons and Punyadham, Kaman Bhiwandi Road, Vasai, Palghar-401208.
(Permanently Unaided | Approved by AICTE, DTE & Affiliated to University of Mumbai)
Accredited with B+ Grade by NAAC | Gujarati Linguistic Minority Institution

ACES
Association of Civil Engineering Students

September 2022
Vol. 5 | Edition 3

THE BENCHMARK

Patrons

Dr. Jitendra B. Patil
- Campus Director

Mr. Rajesh Dubey
-H.O.D. Civil

Faculty Advisor

Mrs. Mitali Poojari
Mr. Usama Diwan

Post Bearers

Mr. Omkar Sankhe
- General Secretary

Mr. Yash Saini
- Joint General Secretary

Mr. Afnaan Shaikh
- Treasurer

Mr. Manas Acharekar
- Social Media Editor

Mr. Dhananjay .V
- Technical Head

Mr. Suyog Kamble
- Creative Head

Mr. Chirag Patel
- Documentation Head

Ms. Kriti Patel
- Hospitality Head

Mr. Bhavya Gada
- Marketing Head

Mr. Harsh Rane
- Public Relation Office

Mr. Tanmay Harne
- Discipline Head

Mr. Deep Parikh
-Editorial Head

Mr. Hari Harsora
-UBA Head

Editor's Desk

We are pleased to present the October 2022 edition of Benchmark. In this edition, you will an article on '**Mumbai Trans-Harbour Link**' and the contribution by Students and Faculty members of the Department of Civil Engineering highlighted in the month of September. News updates and departmental activities are part of Canvas.

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.

Mumbai Trans-Harbour Link

Mumbai Trans Harbour Link (MTHL) by MMRDA is an under construction 6 lane access-controlled sea bridge with a route alignment connecting Sewri in Mumbai with Chirle in Navi Mumbai, Maharashtra. This project has been in the works since the 1990s and several attempts have been made to develop it. The project's foundation stone was laid by Prime Minister Narendra Modi in December 2016, and construction work started in April 2018. It will be completed by L&T and Tata Projects in 2023. MTHL will be the longest bridge/sea link in India. 85% of the MTHL project's construction is being financed by JICA (Japan International Cooperation Agency) which released the first tranche of Rs. 7910 crores ($1.22bn) in March 2017. Total Estimated Cost: Rs. 17,843 crore, Total Project Length: 21.80 km, Bridge Length: 18.187 km, Deadline: 2023, Width: 27m Lanes: 6 (JICA) Owner: Mumbai Metropolitan Region Development Authority (MMRDA) Project Model: EPC (Engineering, Procurement and Construction) General Consultant: AECOM-Padeo-Dar Al Handasah-TYLIN Consortium.

Mumbai Trans Harbour Link will be a six-lane expressway bridge across Mumbai's harbour and pass over Sewri mudflats, Pir Pau Jetty and Thane Creek channels. On the Sewri-end, a three-level interchange is planned to connect with the Sewri-Worli Connector and Eastern Freeway. On the Navi Mumbai-end, the bridge has an interchange each at Shivaji Nagar and Chirle. This concrete bridge will feature a 4 km steel span section in the middle to allow for ships to pass underneath. The longest span of MTHL will be 180m and the shortest will be 100m long. MTHL's lanes will have a width of 3.5 meters with a 2.5-meter-wide shoulder on either side and 0.75m shoulder at the median, based on JICA's recommendation. The maximum speed limit will be restricted to 100 kmph. MTHL will feature an intelligence transport system (ITS) and the other amenities required for a marine bridge. The traffic conditions on the stretch will be monitored and managed from the traffic control center with the help of CCTV cameras and related facilities installed on the stretch. Variable message signs (VMS) will also be

installed to display appropriate information for the bridge users. Current Status as of April 2022, 76% of MTHL's construction work had been completed.

Tenders & Contractors

The project has been divided into 3 civil packages and 1 system package. MMRDA awarded civil construction contracts in November 2017 with a 54 months deadline.

Contractor Package 1: Sewri up to marker 10.38 km (10.38 km) – inter-tidal and marine construction Larsen and Toubro – IHI Corporation JV

Package 2: Marker 10.38-km up to step 18.187 km (7.807 km) – marine construction Daewoo E&C – Tata Projects Limited JV

Package 3: 18.187-km to NH-4B at Chirle (3.613 km) – construction on land Larsen and Toubro

Package 4: Intelligent Transport Systems (ITS) includes Toll and Transport Management System and Equipment Installation STRABAG – EFKON India JV

Three failed attempts- Three attempts at implementing the project in 2006,2007,2013 by the state government had failed. Mumbai: The ₹ 9,640 crore Sewri-Nhava Sheva sea link project failed to draw bids on Monday, the deadline for the submission of quotes by the five shortlisted entities to build the 22.5km trans harbour connection between India's financial capital and its satellite town Navi Mumbai. This was the third attempt by the Maharashtra government to seek bids for the project known as Mumbai Trans Harbour Link (MTHL), which is expected to cut travel time between Mumbai and Navi Mumbai from an hour to around 25 minutes.

- ***Nidhish Vijay Pawar***

To know more about Mumbai Trans harbour Link

Scan the QR OR Link Click Here

EXTENSION OF FLOORS IN RCC BUILDING

This research explains the basis of the structural design process, by way of familiarizing with the requirements of the project and understanding the architectural and services concepts. This research aims at formulating the main design parameters that we will adopt in developing the structural design and detailing of the structure which will be compatible with the architectural theme, satisfy the functional needs, adhering to other applicable building norms and Indian Standards provisions to achieve a safe & stable structure.

The design aims to achieve the following: -

- Structural & functional integrity.
- Required Structural performance under the consideration of characteristic service design loads.
- Design for wind and earthquakes loads. As this is an old structure the same will be checked as per latest IS standards to establish the resistance value.
- Structural durability & maintainability. The current state of the structure is such that if repairs required will be carried out in order to enhance its life.

Case Study:

1.Introduction: The building was constructed in 1986. The structure was planned as industrial building which comprised of 1 Basement, Ground floor level. Office floors start above Ground Floor Level and extend up to 3rd Floor Level. This building also has a Terrace Floor Level along with an Overhead Tank & Lift Machine Room. The Elevation treatment of the building as seen on the image aside is built in brickwork. There is a 6m driveway all around the building sides. The outside ground level is sloped such that one side there is a basement and on other the same basement is visible from the ground floor.

2.Purpose of study: The possibility of adding the proposed floors and its impact on the existing building structure is the main purpose of this research. The structural health condition of the existing structure will also be studied such that improvising and strengthening procedures can be adopted as necessary, to augment the building structural health.

3. Hurdles in Structural Design: The path to assess the capacity of the building structure and ascertaining the number of possible additional floors was not easy because of non-availability of very important documents which could have simplified the whole process. Following were issues we found while carrying out the assessment.

- **Non-availability of structural reinforcement drawings:**

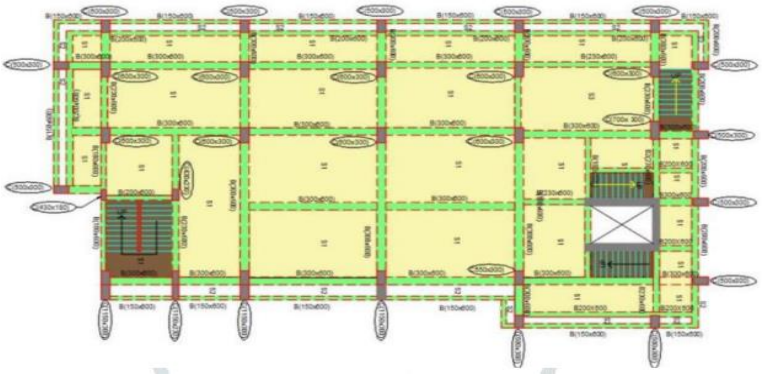
As built RCC drawings were not available with the client and also not present in municipal records. We had to try fetching the same from the consultant who had designed the structure. However, there was no proper record available with the neither the consultant not the municipality. The available references were contacted however; the much-needed RCC reinforcement drawings were not received. Hence it was decided to prepare the complete RCC drawings by doing site measurements & visual survey.

- **Grade of concrete and provide reinforcement is unknown:**

Although the sizing of RCC beam column slab elements could be measured, their concrete grade, quality, strength and reinforcement inside were unknown.

4. Solution: After knowing the above-mentioned issues, the further action plan was prepared and implemented as follows.

- **Preparation of the structural framing plans:**



It was decided to prepare all structural drawings before we start with further the structural analysis and the design checks. Detailed site inspection was carried out and the framing plans for the entire building are prepared based on the site measurements. With the framing plan in place, all relevant information in regard to the column, beam slab sizes are available on the drawing

Test done on structural members to assess the quality and grade of concrete:

A. Non-Destructive Test: -

1. **Rebound Hammer test**
2. **Ultra-sonic pulse velocity test**
3. **Half-cell potential meter test**
4. **Rebar locator**

B. Destructive Test: -

1. **Carbonation test**
2. **Core cutting test**

Methodology Suggested:

There are several methods of strengthening the existing concrete some of them are mentioned below:

- **Concrete Jacketing of existing columns –** when the size and the reinforcement provided in a structural member is insufficient due to change in loads or design then the existing member is surrounded with an additional thickness of concrete with additional required reinforcement. This enhances the size of the given member and thus increases the load carrying capacity of the existing member.
- **Steel Jacketing of existing columns –** here the jacketing is done using the steels plates and these steel plates are anchored to the existing column.

Actual methodology adopted to accommodate the change in design:

Although these are the prevalent methods of strengthening, the approach used in this project is slightly different. Here we have first checked that with the given reinforcement in the columns how much further load can be enhanced over them. So, we found that an additional floor can be taken over the existing terrace floor. The load compensation that was suggested for the additional floor was as below.

- Removal of the loft slabs on the 1st and 2nd floor
- Removal of the terrace water proofing.

- Mohammad Naved Qureshi

Faculty Achievements

A SHORT COURSE On
LANDSLIDES
SC73LS-020

Certificate of participation

This is to certify that

SACHIN ASHOK PAWAR

Assistant Professor

Universal College of Engineering Vasai

has participated in the webinar on "INVESTIGATION OF ROCK SLOPES AND STABILITY ASSESSMENT " organized by SC 7-Student Chapter Activities and Continuing Education on 17-09-2022.

Dr.Sanjay Verma
Event Organizer

Dr M Rama Rao
Convener

A SHORT COURSE On
LANDSLIDES
SC73LS-020

Certificate of participation

This is to certify that

SACHIN ASHOK PAWAR

Assistant Professor

Universal College of Engineering Vasai

has participated in the webinar on "LANDSLIDE SUSCEPTIBILITY MAPPING THROUGH MACHINE LEARNING TECHNIQUES " organized by SC 7-Student Chapter Activities and Continuing Education on 10-09-2022.

Dr.B Janaki Ramaiah
Event Organizer

Dr M Rama Rao
Convener

A SHORT COURSE On
LANDSLIDES
SC73LS-020

Certificate of participation

This is to certify that

SACHIN ASHOK PAWAR

Assistant Professor

Universal College of Engineering Vasai

has participated in the webinar on " INTRODUCTION TO LANDSLIDES AND ANALYSIS OF FINITE AND INFINITE SLOPES " organized by SC 7-Student Chapter Activities and Continuing Education on 09-09-2022.

Dr.Sreevalsa Kolathayar
Event Organizer

Dr M Rama Rao
Convener

A SHORT COURSE On
LANDSLIDES
SC73LS-020

Certificate of participation

This is to certify that

SACHIN ASHOK PAWAR

Assistant Professor

Universal College Engineering Vasai

has participated in the webinar on " LANDSLIDES MITIGATION TECHNIQUES " organized by SC 7-Student Chapter Activities and Continuing Education on 16-09-2022.

Dr.V.A.Sawant
Event Organizer

Dr M Rama Rao
Convener

NEWS BULLETIN

Researchers use a swarm of drones for construction work and repairs

By **Lucia Gartner** - Sep 26, 2022

Picture: Yusuf Furkan KAYA, Aerial Robotics Laboratory, Imperial College London / Empa

An international research team led by drone expert Mirko Kovac from Empa and Imperial College London has taken bees as a model to develop a swarm of cooperative drones. Under human control, the flying robots work as a team to print 3D materials for building or repairing structures, as the scientists report in the cover story of the latest issue of the science journal Nature.

Climate change from the ground up: Researchers explore sea level rise impact on building foundations

Date: September 16, 2022

Source: Colorado State University

Summary: Researchers have considered how flooding from rising sea levels and storm surges will damage the built environment along the coast, but what about climate change's less noticeable impacts below the surface? A new study by civil engineers examines the hidden costs to building foundations due to sea level rise. They propose a method for inspection and repair to lower the cost associated with deterioration from saltwater corrosion.

Intriguing material property found in complex nanostructures could dissipate energy

Date: September 13, 2022

Source: University of Texas at Austin

Summary: Researchers have discovered a unique property in complex nanostructures that has thus far only been found in simple nanostructures. Additionally, they have unraveled the internal mechanics of the materials that makes this property possible.

In order to create materials that will transform electronics, **researchers at the University of Virginia School of Medicine and its associates overcame a virtually impossible challenge using DNA**.

Departmental Activity

Seminar on **"Construction Management Course"**

The seminar was organized by team ACES for the students who wanted to pursue construction Management in the future. This course was so unique because it was never been taught before to any Engineering students. The seminar began with our host, Mr. Yash Saini introducing the speakers and the seminar. It was held on 20th September, 10.30 am by Mr. Arshad khatri & Mr. Mudassar khatri.

The treasurer of ACES, Mr. Afnan Shaikh felicitated the speaker Mr. Arshad Khatri who then started the seminar. Mr. Arshad Khatri started to explain about the course and guided the students to plan their future and find their passion. The seminar was concluded with a vote of thanks from Mr. Yash Saini.

"A unique course which has never been taught to any Engineering students".

The powerful key to become an empowered construction professional to find yourself to be more innovative and informed to build better. It's a Course which will teach the following modules:

- Construction Site Management
- Contracts and Commercial Management
- Project Planning and Control Management
- Procurement Management
- Project Quality Management
- EDMS & Information Management
- Design Management

Mr. Khatri and Mr. Afnan Shaikh

ENGINEER'S DAY CELEBRATION

After 2 years of waiting patiently, Tantrotsav was organized by the Association of Civil Engineering Students (ACES), in offline mode. The students of Universal College of Engineering and Universal College of Architecture (for the first time) participated in various technical events throughout the day. Tantrotsav 2k22 was celebrated on the occasion of Engineers Day. The event started by lighting the lamp for Saraswati Vandana followed by a beautiful welcome dance performed by Ms. Pratima Tiwari. It was followed by a speech given by the General Secretary of ACES, Mr. Omkar Sankhe and Faculty Advisor Mrs. Mitali Poojari.

The Event was then followed by the speech of Dr. J. B. Patil addressing the participants and announcing that Tantrotsav from the next year be organized at **Inter-college level.**

The chief Guest of the day, Mr. Ramesh Mukund, the Managing Director of Imperial Lifestyle motivated and encouraged the students to become a better version of themselves. All the students dispersed to their respective classes to participate in various events. The events were technical yet fun, they tested the students' knowledge and their skills. In a nutshell, the event was very joyful and enthusiastic. Total there were 600 student participation. After completion of Technical Events during the lunch break Entertainment for student was arrange in which Culture Programs like singing, dancing, games and fun Activities.

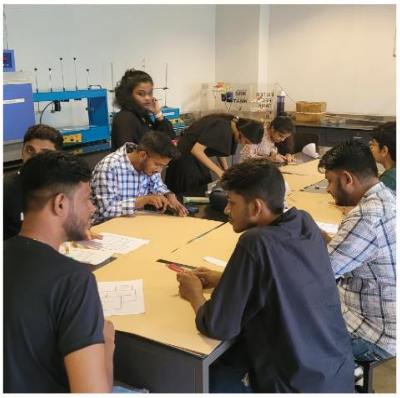
For very first time Departmental Trophy was introduced in which winning criteria was judge on bases of number of participants in each event and the winner of Departmental Trophy was awarded to the department of Information Technology. The hosting during Entire season were done superbly by Chirag Patel and Naazneen Shaikh. Ms. Uzma Shaikh got her badge and the responsibilities as the IEI Head, UCOE Chapter.

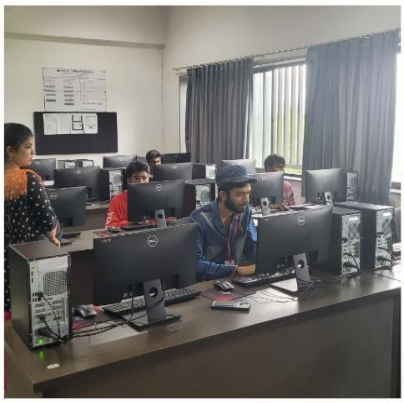
Mr. Nikhil Sontakke, the event co-ordinator of Tantrotsav spoke a few words to highlight the efforts made by the students in arranging Tantrotsav 2k22. The event was then concluded by prize distribution and a vote of thanks given by the treasurer of ACES Mr. Afnaan Shaikh.

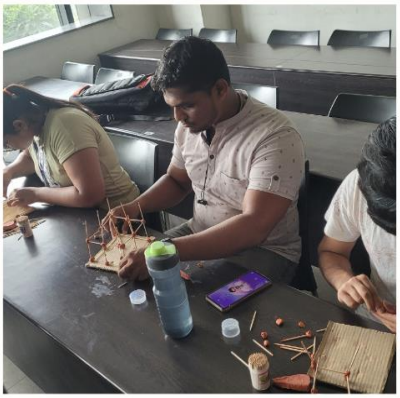
Tantrotsav 2K22

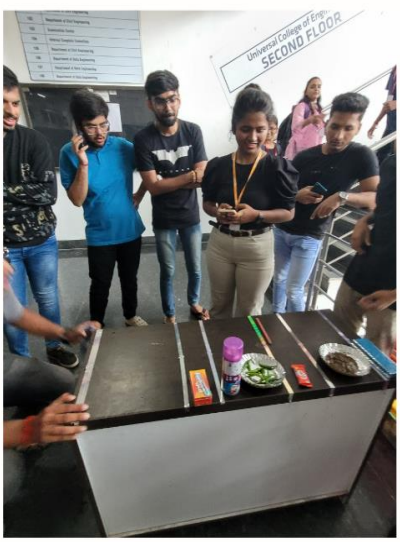

TANTROTSAV


Vidya Vikas Education Trust's
Universal College of Engineering
ACES
ASSOCIATE PARTNERS
HRIDAAN
CLAPBOX
96 99 55 22 00
THIS FESTIVE SEASON EXPERIENCE
LUXURY LIVING
VASAI - BOISAR








Universal College of Engg
SECOND FLOOR


Poman, Maharashtra,
7.76 m, 162.1 deg, start point = {19.35
end point = {19.350488, 72.917211},
Phata Rd, Poman, Maharashtra 40120
Lat 19.350584°
Long 72.916747°
15/09/22 12:50 PM GMT +05:30

Congratulations to Student were the winner and runner up from Civil Department:

Winner:

- Sukesh Suripogu (TE Civil)- **Balancia**
- Vatsal Parmar (BE Civil)- **Technical Tambola**

Runner-Up:

Build a Beam

- Aditya Aniwale
- Prathamesh Chavhan
- Sandesh Davde
- Sahil Sawant

Brain Buzzer

- Ayush Patil
- Yash Bhosale

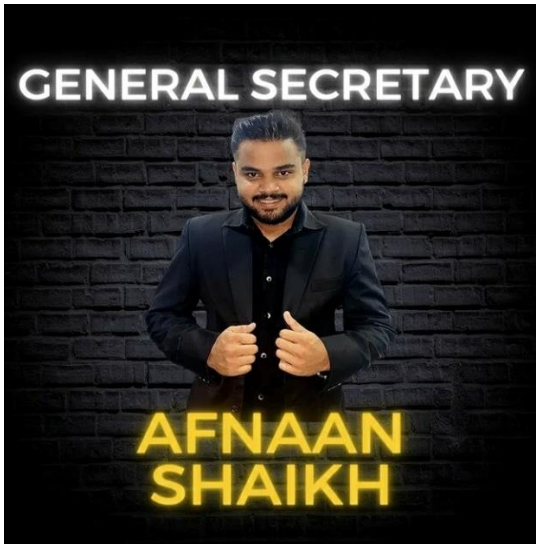
Urbania

- Simran Vaidya
- Shriya Pawaskar
- Pratima Tiwari
- Diya Patil

Special moments

Fun Activities

STUDENTS' ACHIEVEMENT



Leadership is an action, not a position.
Mr. Afnan Shaikh efforts and hard work in the college event during Tantrotsav and Management Skills have made him stand out as the best candidate for the post. He has been elected as the **General Secretary of Student Council** for the academic year 2022-23.

She is someone who has worked with Team ACES, unconditionally and has always worked towards making the events organized by ACES a grand success.

She has been a core member of the team of ACES. She represents the women in Civil Engineering Department. She has contributed to the betterment of the department in all ways.

She has never asked for anything in return and given her full energy towards team ACES.Now, she has been selected as **IEI Students Chapter Head** for the academic year 2022-23 Ms. Uzma Shaikh.

A Leadership is a skill that not everyone is blessed with, a skill that allows an individual to lead people for the greater good of society.

Mr. Harsh Rane efforts and hard work in the college and well-being of the society have made him stand out as the best candidate for the **Leader of NSS Unit** for the academic year 2022-23.

CANVAS

Ayush Patil

Aayush Desai

Aditya Kamble

Tulsi Nair