Vidya Vikas Education Trust's
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Gujarati Linguistic Minority Institution
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The Benchmark

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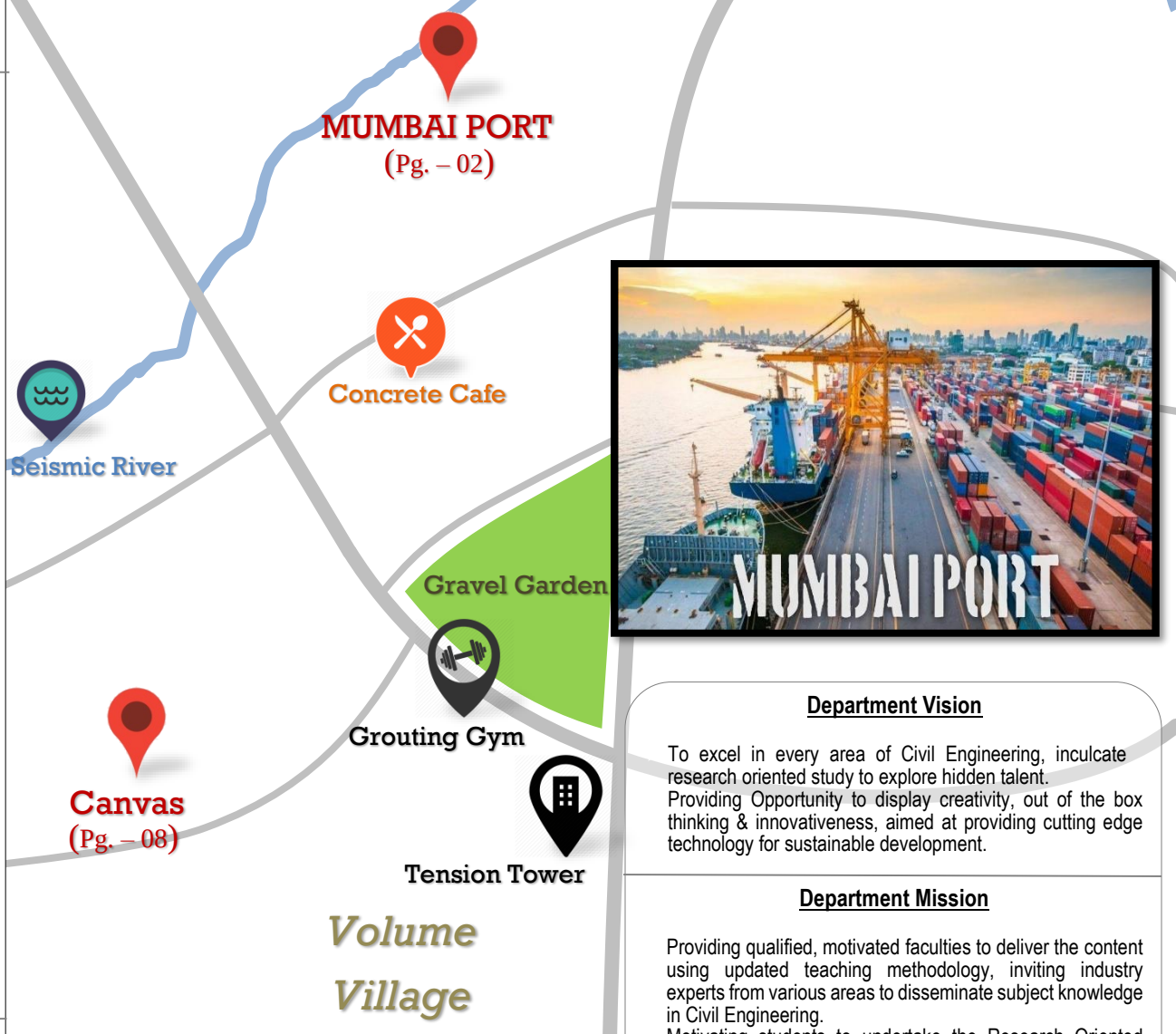


Editor's Desk

We are pleased to present June 2021 edition of Benchmark. In this edition you will an article on Mumbai Port and contribution by Students and Faculty members of Department of Civil Engineering highlighted in the month of May. 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.

MUMBAI PORT

Overview

Mumbai Port: The western coast city of Mumbai is home to India's largest port by size and shipping traffic. The port is situated in a natural harbour with water reaching depths of 10-12 meters, allowing easy docking and passage for large cargo ships. The Mumbai Port is critical to the Indian economy and trade operations as it handles 20% of the foreign trade. It was the first container terminal in India, which handled over 2 million TEU(Twenty-foot equivalent unit per year). It has four jetties that control several imports and exports, including manganese, crude and petroleum oil, textiles, tobacco, liquid chemicals, leather and heavy machinery.

HISTORY

The Port of Mumbai is one of India's premier ports, located in Mumbai, the capital city of the state of Maharashtra. The port has a natural deepwater harbour of 400km2, which is protected by the mainland of Konkan on the eastern side and the island of Mumbai on the western side.

Port of Mumbai facilities

The Port of Mumbai provides integrated sea-port facilities to handle, store and deliver cargo. The port is well connected through an extensive road network of 126km.

The port has its own railway system connected to the Central and Western Railway through the broad gauge main line. With a track of nearly 100km and five diesel locomotives, the port's railway system serves docks and important installations and factories on its estates.

Mumbai's port can supply drinking water to the ships in the stream and at the berths. Water to the berthed ships is supplied through hydrants installed alongside the berths, whereas vessels in the stream obtain water from water boats. Almost all the berths can be used for oil bunkering.

Cargo storage facilities are available in the docks and outlying areas of the port.

FACTS

"The Port of Mumbai has completed 137 years of its service."

"In 2008-09 Mumbai port handled 51.9 million tonnes of cargo."

Photos

Established in 1873, It is administered by the Mumbai Port Trust. The port is spread over an area of 46.3 hectares we has 63 anchorage points and a total quay length of 7,800m. The port has made pilotage necessary for ships of 100t and above arriving and departing the harbour.

In August 2010 the port was closed for a few days due to an oil spill that resulted from the collision of merchant vessels MSC Chitra and MV Khalija-III, some five nautical miles off Mumbai. Crude oil containers in MSC Chitra fell into the water and leaked as the ship tilted following the collision. Hundreds of tonnes of oil is estimated to have leaked into the Arabian Sea.

DID YOU KNOW?

The most expensive coffee in the world is brewed from beans partially digested and defecated by the Asian palm civet.

To know more about Mumbai Port, Scan the QR Code

Data Loss Prevention (DLP) in the Pandemic Era: Trends & Emerging Solutions

The risk of data loss has surged amidst the Covid-19 pandemic, creating a new level of complexity around data loss protection (DLP), regulatory compliance, and governance. From a DLP standpoint, few companies were prepared for the realities of a sudden, work-from-home environment. Especially in the early days of the pandemic, employees moved and used data freely, often in unsanctioned ways.

In fact, according to Digital Guardian's Data Trends Report from 1st March to 15th April, 2020:

- There was a 123% increase in data downloaded to USB devices by employees. 74% of that data was classified by organization data governance policies.
- Cloud storage and USB devices were the most preferred egress paths after the pandemic declaration, accounting for 89% of all data egressed.
- Data egress across all paths (email, cloud, USB, etc.) was 80% higher in the first month following WHO's COVID-19 pandemic declaration. More than 50% of that data was classified.
- Malicious external activity, increased by 62% following WHO's pandemic declaration.

Though most insider incidents and data leakage could be considered inadvertent, a small but growing percentage were acts of deliberate data exfiltration. For example, 35% of employees take company documents and data with them when they leave a job, according to Tessian's 2020 report, "Why DLP Has Failed and What the Future Looks Like." This same survey also found that:

- 48% of employees say they're less likely to follow safe data practices when working from home
- Data loss incidents on email happen 38x more often than IT leaders think

Despite the uptick in insider threats and incidents, external bad actors remain the primary perpetrators of data breaches. According to Verizon's "2020 Verizon Data Breach Investigations" report, over half of all "unwanted occupant" are organized, professional criminals and 60% of incidents are DoS.

Emerging DLP Tools & Solutions

Given the growing threat of both malicious and inadvertent data leaks, the DLP solutions market is expected to grow from $1.21 billion in 2020 to 3.75 billion by 2026 at a CAGR of 23.59%.

As more and more organizations move to the cloud, organizations will move from an identity-as-the-perimeter approach to zero trust frameworks. In fact, 60% of companies will replace VPNs with zero trust network access (ZTNA) by 2023 according to Gartner.

Artificial Intelligence (AI) and machine learning (ML) are also being widely adopted for DLP purposes. AI-powered behavioural analytics has proven to be effective at identifying anomalous behaviour that could indicate malicious activity. AI has also an effective tool for orchestrating the configuration of adjacent and impacted systems to reduce the propagation and scope of breaches. Though AI has yet to be widely adopted due to its current limitations and vulnerabilities, the AI cyber security market is projected to grow from $8.6 billion in 2019 to $101.8 billion by 2030.

As malicious actors become increasingly sophisticated, ethical hacking has also emerged as one potential way to expose and close vulnerabilities. For example, Beacon AI recently launched a new ethical hacking service designed to specifically address the increased risks of remote working for companies that have sensitive information and IP to protect.

-Mr. Swapnil Wani
Asst. Professor UCoE

"Security is mostly a superstition. Life is either a daring adventure or nothing."
- Helen Keller

How Earthquake-Proof Buildings are Designed

Throughout history, we've built impressive structures and cities only for them to encounter the forces of nature. Earthquakes are one of the Earth's most destructive forces, the seismic waves throughout the ground can destroy buildings, take lives, and costs tremendous amounts of money for loss and repair. According to the National Earthquake Information Centre, there is an average of 20,000 earthquakes each year, 16 of them being major disasters. On September 20, 2017, a magnitude 7.1 rocked Mexico's capital city and killed approximately 230 people. As with the case with other earthquakes, the damage was not caused by the quake itself but by the collapse of buildings with people inside them, making earthquake-proof buildings a must.

Over the past few decades, engineers have introduced new designs and building materials to better equip buildings to withstand earthquakes. Read on to learn how earthquake-proof buildings are designed today.

- **How to make a building Earthquake-Proof**

To design an earthquake-proof building, engineers need to reinforce the structure and counteract an earthquake's forces. Since earthquakes release energy that pushes on a building from one direction, the strategy is to have the building push the opposite way. Here are some of the methods used to help buildings withstand earthquakes.

1. **Create a Flexible Foundation**

One way to resist ground forces is to "lift" the building's foundation above the earth. Base isolation involves constructing a building on top of flexible pads made of steel, rubber, and lead. When the base moves during the earthquake, the isolators vibrate while the structure itself remains steady. This effectively helps to absorb seismic waves and prevent them from traveling through a building.

2. **Counter Forces with Damping**

You might be aware that cars have shock absorbers. However, you might not know that engineers also use them for making earthquake-resistant buildings. Similar to their use in cars, shock absorbers reduce the magnitude of shockwaves and help buildings slow down. This is accomplished in two ways: vibrational control devices and pendulum dampers.

- **Vibrational Control Devices**
  The first method involves placing dampers at each level of a building between a column and beam. Each damper consists of piston heads inside a cylinder filled with silicone oil. When an earthquake occurs, the building transfers the vibration energy into the pistons, pushes against the oil. The energy is transformed into heat, dissipating the force of the vibrations.

- **Pendulum Power**
  Another damping method is pendulum power, used primarily in skyscrapers. Engineers suspend a large ball with steel cables with a system of hydraulics at the top of the building. When the building begins the sway, the ball acts as a pendulum and moves in the opposite direction to stabilize the direction. Like damping, these features are tuned to match and counteract the building's frequency in the event of an earthquake.

3. Shield Buildings from Vibrations

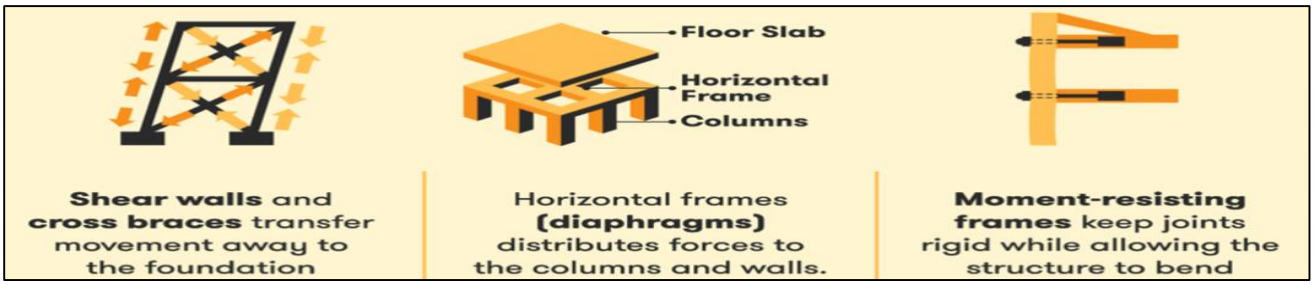
Instead of just counteracting forces, researchers are experimenting with ways buildings can deflect and reroute the energy from earthquakes altogether. Dubbed the "seismic invisibility cloak", this innovation involves creating a cloak of 100 concentric plastic and concrete rings in and burying it at least three feet beneath the foundation of the building. As seismic waves enter the rings, they are forced to move through to the outer rings for easier travel. As a result, they are essentially channelled away from the building and dissipated into the plates in the ground.

4. Reinforce the Building's Structure

To withstand collapse, buildings need to redistribute the forces that travel through them during a seismic event. Shear walls, cross braces, diaphragms, and moment-resisting frames are central to reinforcing a building.

Scratch Your Head!!

1) **No of spikes on the crown of staue of liberty _____**



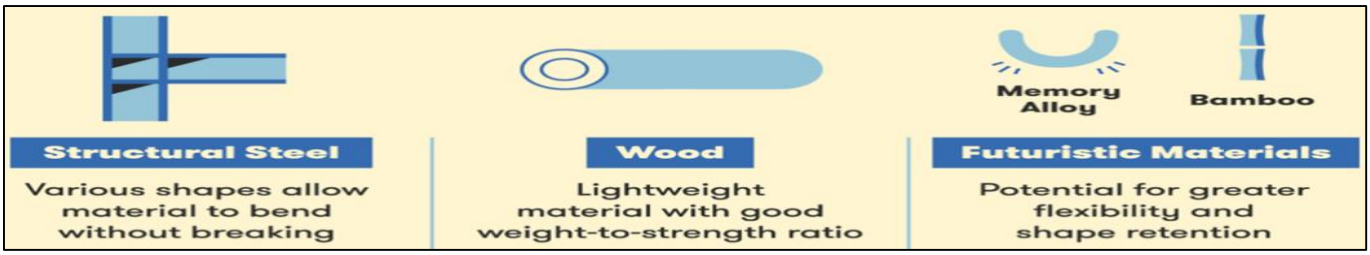
Shear walls are a useful building technology that helps to transfer earthquake forces. Made of panels, these walls help a building keep its shape during movement. Shear walls are often supported by diagonal cross braces. These steel beams have the ability to support compression and tension, which helps to counteract the pressure and push forces back to the foundation.

Diaphragms are a central part of a building's structure. Consisting of the floors of the building, the roof, and the decks placed over them, diaphragms help remove tension from the floor and push force to the vertical structures of the building.

Moment-resisting frames provide more flexibility in a building's design. This structure is placed among the joints of the building and allows for the columns and beams to bend while the joints remain rigid. Thus, the building is able to resist the larger forces of an earthquake while allowing designers more freedom to arrange building elements.

- **Earthquake-Resistant Materials**

While shock absorbers, pendulums, and "invisibility cloaks" may help dispel the energy to an extent, the materials used in a building are equally responsible for its stability.



1. Steel and Wood

For a building material to resist stress and vibration, it must have high ductility, the ability to undergo large deformations and tension. Modern buildings are often constructed with structural steel, a component of steel that comes in a variety of shapes that allow buildings to bend without breaking. Wood is also a surprising ductile material due to its high strength relative to its lightweight structure.

2. Innovative Materials

Scientists and engineers are developing new building materials with even greater shape retention. Innovations like shape memory alloys have the ability to both endure heavy strain and revert to their original shape, while fiber-reinforced plastic wrap — made by a variety of polymers — can be wrapped around columns and provide up to 38% greater strength and ductility.

Engineers are also turning to natural elements. The sticky yet rigid fibers of mussels and the strength-to-size ratio of spider silk have promising capabilities in creating structures. Bamboo and 3D printed materials can also function as lightweight, interlocking structures with limitless forms that can potentially provide even greater resistance for buildings. Over the years, engineers and scientists have devised techniques to create some effective earthquake-proof buildings. As advanced the technology and materials are today, it is not yet possible for building to completely withstand a powerful earthquake unscathed. Still, if a building is able to allow its occupants to escape without collapsing and saves lives and communities, we can consider that a great success.

-Mr. Nikhil Sontakke
Asst. Professor UCoE

DID YOU KNOW?

Bulls are color blind. The color red does not make bulls go crazy.

News Bulletin

❖ Tech to predict movement of impurities via soil made: IIT Mandi

IIT Mandi researchers have co-developed software which they claim accurately predicts the movement of contaminants through complex soil structure. It's especially useful in estimating fertiliser application in agricultural fields and designing disposal mechanisms for complex chemicals. The model can be used in planning and designing landfill and groundwater remediation sites.

❖ Giant blinking star spotted near galaxy's centre

Astronomers have spotted a giant 'blinking' star, VVV-WIT-08, towards the centre of the Milky Way, the University of Cambridge said. The star might belong to a new class of "blinking giant" binary star system. In the system, a giant star 100 times larger than the Sun is eclipsed once every few decades by an as-yet-unseen orbital companion.

❖ PM Modi surprises students, parents by joining online CBSE session

PM Narendra Modi on Thursday surprised students and parents after he joined a virtual session with CBSE students conducted by the Education Ministry. PM Modi also interacted with them and heard their issues and concerns. This comes two days after the government decided to cancel Class 12 CBSE board exams due to COVID-19 crisis.

❖ What is 6-minute walk test to check if a person has low oxygen level in body?

Government has recommended the six-minute walk test for mild and moderate COVID-19 patients to check if they've low oxygen level. Patients are advised to walk around their room for six minutes with an oximeter attached to their finger. If the patient's oxygen saturation drops below 94% or he/she feels unwell during or after the test, they should consult a doctor.

Scratch Your Head!!

2) There are _____ dimples on golf ball

Option :- a) 337 b) 335
c) 333 d) 336

Farewell 2021

On 19th May 2021 Association of Civil Engineering Students formally known as ACES of Universal College of Engineering prepared a once in a lifetime event for BE students of the Civil Department i.e., their Farewell Ceremony.

The event took place on Google Meet around 4 pm where all BE students, CD sir J.B.Patil, civil department teachers, and members of the ACES team were assembled. The whole event was hosted by the Creative Head of ACES Rohan Talekar.

As the event started, a welcome speech was given by the Internal Public Relation Officer of ACES Khushi Patil. Further CD sir addressed the BE students and gave them some valuable advice. As the event procceded Professor Rajesh Dubey sir talk to all students one last time as the HOD of the Department.

However, on behalf of all civil faculty, Professor Nikhil Sontake sir spoke two words to all BE students. After so, a speech was given by the Hospitality Head of ACES Vrushti Makawana.

To make the event more fun and entertaining External Head of ACES Dhruv Parmar hosted a game for BE students where he showed the signature of each facility member and asked students to guess who's signature it is. The student guessing the maximum correctly was the winner.

After that ACES team did a small PPT and asked the BE students to again guess a name to the title displayed which was ultimately given to their classmates, everyone had fun guess the names and relived all the good old memories.

As the event moved towards the end a speech was given by ACES General Secretary Rahul Patil as he thanked ACES on behalf of all BE students for arranging such a beautiful event.

In the end, Rohan Talekar put an ending mark for the event by giving the Vote of Thanks addressing CD sir, facility members to joining the event and at last the BE students wishing them all the luck and happiness for the future. Thus yet another event hosted by ACES came to an end.

❖ Webinar or Training Program by Faculty in May 2021

Sr.no	Name of the Faculty	Date	Webinar Name
1	Sachin Pawar	17 May to 23 May	ArcGIS Training Programme_ GeoVigyan (1. Application of GIS in details and brief introduction to the software tools. 2.Training on to use the software tools, related to resource mapping and other image processing tools. 3. Introduction of different band ratio and Application in Software (MNDVI, NDSI, MNDWI, SAVI, NDBI etc.). 4. Application of Google Earth pro for features extraction and data interpolation. 5. Training on land surface temperature calculations and MODIS temperature products.)
2	Asir Khan	23 May to 6 June	15day road safety audit course at SV National Institute of Technoly, Surat (Road safety certification course by Ministry of Road Transport and Highway MORTH and Indian Road Congress IRC)
3	R S Dubey	7 June	Webinar on impact of education on future generations

"The pessimist sees difficulty in every opportunity. The optimist sees opportunity in every difficulty."
- Winston Churchill

CANVAS

-Mr.Rahul Patil
B.E. CIVIL

-Ms.Shweta Bhadekar
B.E. CIVIL

-Mr.Rahul Patil
B.E. CIVIL

Upcoming Events

Believe in yourself as you get ready for the exams. If you believe in yourself, nothing can hinder you from achieving success. All the best for your exams.Don't stress yourself.

Arm yourself with the can-do spirit and you shall pass this exam with flying colors. Good luck for your ends semester exams.

ANSWERS to "Scratch Your Head"
1) 7 2) 336