



Vidya Vikas Education Trust's

Universal College of Engineering

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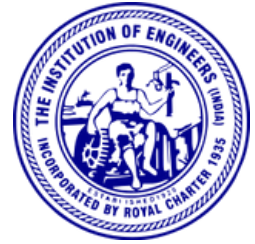


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THE BENCHMARK



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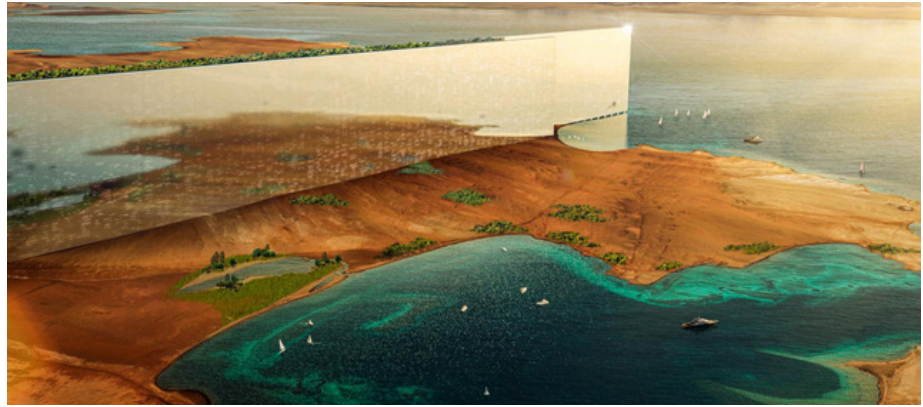
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We are pleased to present the September 2022 edition of Benchmark. In this edition, you will find an article on 'THE LINE' Saudi Arabia and the contribution by Students and Faculty members of the Department of Civil Engineering highlighted in the month of August. 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.



Meet The Line, Saudi Arabia's Future 106-mile, One-building City

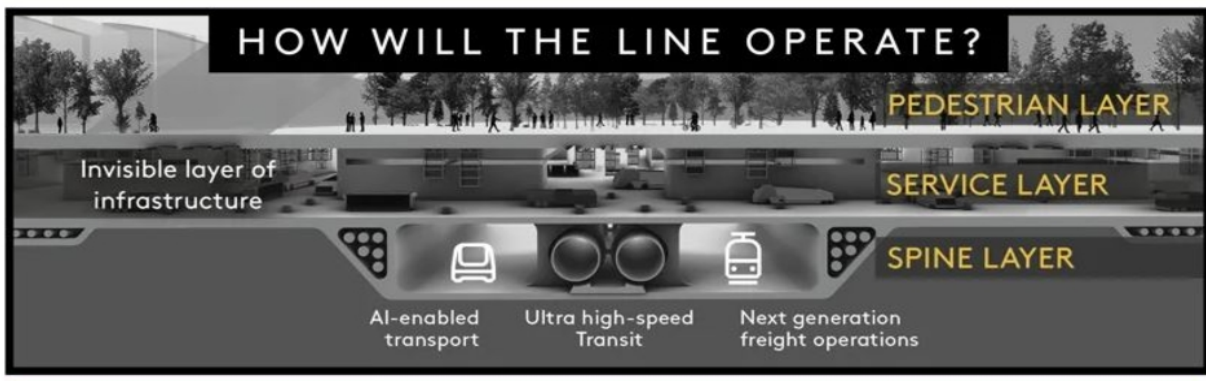
Saudi Arabia is home to some of the world's most interesting and ambitious architecture, but the country's newest urban project may just top them all. The government of Saudi Arabia unveiled plans in 2021 for the city of Neom, including a megastructure called **The Line**, a massive scheme still years from completion. **The Line** is designed to be an entire city composed of two parallel, 656-foot-wide (200-meter-wide) skyscrapers, each 106 miles (170 kilometers) long and 1,640 feet (500 meters) high (higher than most of the world's tallest skyscrapers), stretching across the northwest part of Saudi Arabia near the Red Sea.

If you think this sounds like the setting for a futuristic, dystopian novel, you're not wrong. **The Line** is characterized as a One-Building vertical metropolis with external mirrors that can accommodate 9 million people and has everything they may possibly need, such as parks and waterfalls, flying taxis, and robot maids. Even the inclusion of a fake moon for locals to enjoy is planned.

With its proposed width of only 656 feet, **The Line** will rely primarily on its height to encompass its residents and a host of modern trappings, such as a high-speed rail to connect sections of the 106-mile city. Saudi Arabian officials claim **The Line** will be otherwise devoid of roads, cars or emissions and will be powered strictly by clean energy. Here are a few of most notable proposed features of The Line:

- vertically layered homes, offices, public parks and public schools.

- year-round climate control of all indoor and outdoor spaces.
- high-speed rail that will transport residents from end-to-end in 20 minutes.
- 5-minute walk to all amenities.
- accessibility to parks and natural elements within a 2-minute walk.



Although a timeline was not part of **The Line's** announcement, initial earthwork began in October 2021, and it is expected that residents will begin moving in by the year 2030. This deadline was shared as part of a larger countrywide improvement plan dubbed Vision 2030 that is intended to draw 100 million annual visitors and keep Saudi Arabia in the running against travel hot spots like its Gulf neighbors of Dubai and Abu Dhabi. The Line is just one part of the \$500 billion Neom Project, an initiative announced in 2017, nested in the Vision 2030 plan and focused on the Northwest part of Saudi Arabia.

Along with **The Line**, there are plans to build a network of airports as well as the world's largest green energy plant. The area is intended to become so self-sufficient that it is being referred to as a "country within a country" where residents will be called "**Neomians**" rather than "Saudis."

"All people from all corners of the globe will be able to leave their creative and original imprint on the planet at NEOM. NEOM remains to be one of Saudi Vision 2030's most crucially important projects, and we are steadfastly committed to completing The Line on behalf of the country " in a press release on July 25, 2022, Saudi Crown Prince Mohammed bin Salman made the assertion.



*To know more about The Line,
Scan the QR Code*

**-BY RISHABH YADAV
T.E. CIVIL**

Geofoam Construction & Application to Industry

During the last few years, geotechnical engineering professionals and academics have become increasingly aware and familiar with the application of geofoam materials. The generic name "geofoam" was proposed by Horvath (1992) to describe all rigid plastic foam that's used in geotechnical applications. Later, the definition of geofoam was broadened to include any cellular material or product created by an expansion process. These synthetic materials are now recognized as a category of geosynthetics, as proposed by Horvath.

Although several materials have been used as geofoams, the majority of applications, involve the use of EPS. EPS is manufactured by first heating expandable polystyrene solid beads to produce a bulk of cellular spheres containing numerous closed cells and having a diameter of three to four times the diameter of the initial solid beads. The analysis and design of geotechnical application, using the functions of geofoam mentioned above, require the knowledge of the mechanical properties of geofoam in both the static and dynamic loading range. Although a considerable amount of data pertaining to the mechanical behaviour of EPS under static loading conditions have been reported in the geotechnical literature in the last few years

The manufacture of rigid plastic foams dates back to the 1950s, with adaptation for geotechnical use occurring in the early 1960s. In 1992, the category of "Geofoam" was proposed as an addition to the variety of geosynthetics already in existence. The most commonly used Geofoam material is a polymeric form called expanded polystyrene (EPS), also known as expanded polystyrene

outside of the United States. Such widespread use can be attributed to global availability, significantly lower cost than other materials, and the absence of postproduction long-term release of gases such as formaldehyde or CFC, a behaviour observed with other polymeric forms. The most common method of producing EPS Geofoam is block moulding, in which a mould is used to create a prismatic rectangular block. Depending upon the application, other mould shapes can be used, however it is more common to shape the blocks post-production. The raw material used to create Geofoam is referred to as expandable polystyrene, or often resin, and is composed of small beads with diameters similar to medium to coarse sand (0.2 to 3 mm). The bead size chosen will not ultimately affect the engineering properties of the completed block. The beads are composed of polystyrene and a dissolved petroleum hydrocarbon, usually pentane or rarely butane, which acts as the blowing agent. The beads may also contain other additives to affect certain properties of the completed block (flammability, etc.), however this is dependent upon the application in a similar fashion to the addition of admixtures in concrete. The density of EPS Geofoam is controlled primarily through regulation of the manufacturing. It has been found that even with a well-controlled manufacturing process, there will still be variability in density between blocks from the same production run, as well as a density gradient within each block. This can affect the geotechnical properties of the material, as density has been found to be a controlling factor in the performance of the Geofoam.

The actual range of densities that EPS blocks can be manufactured is between approximately 10 kg/m³ (0.6 lb/ft³) and 100 kg/m³ (6 lb/ft³). The low density of EPS Geofoam results in the development of uplift forces when submerged in water, and therefore for many design situations an anchor system or adequate surcharge load (e.g., soil cover) is required. The dimensions of Geofoam blocks affect only cost and construction layout, and not the engineering properties of the blocks. There are no standard sizes for EPS block melds and given the numerous applications of Geofoam blocks and abundant manufacturers (over 100 in the United States), there is much variability in dimensions of raw Geofoam blocks. Typically, designers attempt to use full-sized blocks and when necessary, blocks can be cut to shapes in-situ with a hot wire or, less effectively, a chainsaw. An alternative to in situ shaping of the blocks is custom manufacture of the block mass, in which the EPS producer uses the construction plans to develop an efficient layout for the block mass, however this is usually reserved for complex projects due to the associated increases in cost. EPS Geofoam has proven to be quite durable when exposed to common natural elements. Polystyrene is non-biodegradable, and is inert in both soil and water. Exposure to ultraviolet (UV) radiation from sunlight causes only cosmetic discolorations, and only after an extended period of time, allowing for a window of exposure time during the construction period. Exposure to water may result in a small amount of absorption, the magnitude of which is inversely proportional to the density of the geofoam and is dependent upon numerous factors such as Geofoam block thickness, surrounding hydraulic



gradients, and the phase of the water. Water absorption does not affect the volume of the EPS, and there is no effect on mechanical properties. Exposure to certain substances and conditions can result in damage to the polystyrene. The use of polystyrene in transportation projects risks the material coming into contact with common fuels, which polystyrene will readily dissolve in, or road salts, however this risk is usually eliminated through the proper installation of a barrier such as an impermeable membrane. Polystyrene can be flammable when exposed to an ignition source, as is the blowing agent used in production. An additive, usually consisting of a bromine-based chemical, added to the expandable polystyrene causes the material to become flame retardant. The issue of ignition of the flammable blowing agent is resolved by allowing adequate seasoning time of the EPS block in order to allow out gassing to occur. Flame retardant EPS can still melt when exposed to extreme temperatures between approximately 150 and 260°C, however maximum exposure temperatures for design conditions are usually considerably lower. The thermal conductivity of dry EPS Geofoam is affected by the density of the material, which can be controlled during the manufacturing stage,

and the ambient temperature. Generally, the thermal conductivity of dry EPS Geofoam is approximately 30 to 40 times less than that of soil, making it a very efficient insulator. The effect of absorbed water upon thermal conductivity is more difficult to quantify, given the numerous factors affecting the volume of water uptake (Stark et. al. 2004). As water has a higher thermal conductivity than dry EPS Geofoam, moisture absorption is expected to result in an increase in thermal conductivity. Even under extreme cases of moisture absorption, EPS Geofoam serves as a better insulator than soil.

❖ **Advantages:**

- Low density/high strength: Geofoam is 1% to 2% The density of soil with equal strength.

- Inert: Geofoam will not break down, so it will not spread into surrounding soils. This means that geofoam will not pollute the surrounding soil.

❖ **Disadvantages:**

- Fire hazards: Untreated geofoam is a fire hazard.
- Vulnerable to petroleum solvents: If geofoam comes in contact with a petroleum solvent, it will immediately turn into a glue-type substance, making it unable to support any load.
- Buoyancy: Forces developed because of buoyancy can result in a dangerous uplift force.

FACULTY ACHIEVEMENTS



Non-Curricular Activities

TREE PLANTATION BY NSS STUDENT

Trees are the foremost source for producing the oxygen in environment, they help to reduce the level of CO₂. As we all know that the whole world is facing the problem of global warming and to recover from such problem planting the trees is become one of the most important aspects today. People understood the importance of planting trees and this increased their love towards our nature. On 14th August 2022, Event began at sharp 9.45am in the morning everyone began to plant trees in our college open ground. volunteers and PO everyone actively participated in this event. The event ended at 11am. The event was absolutely wonderful.



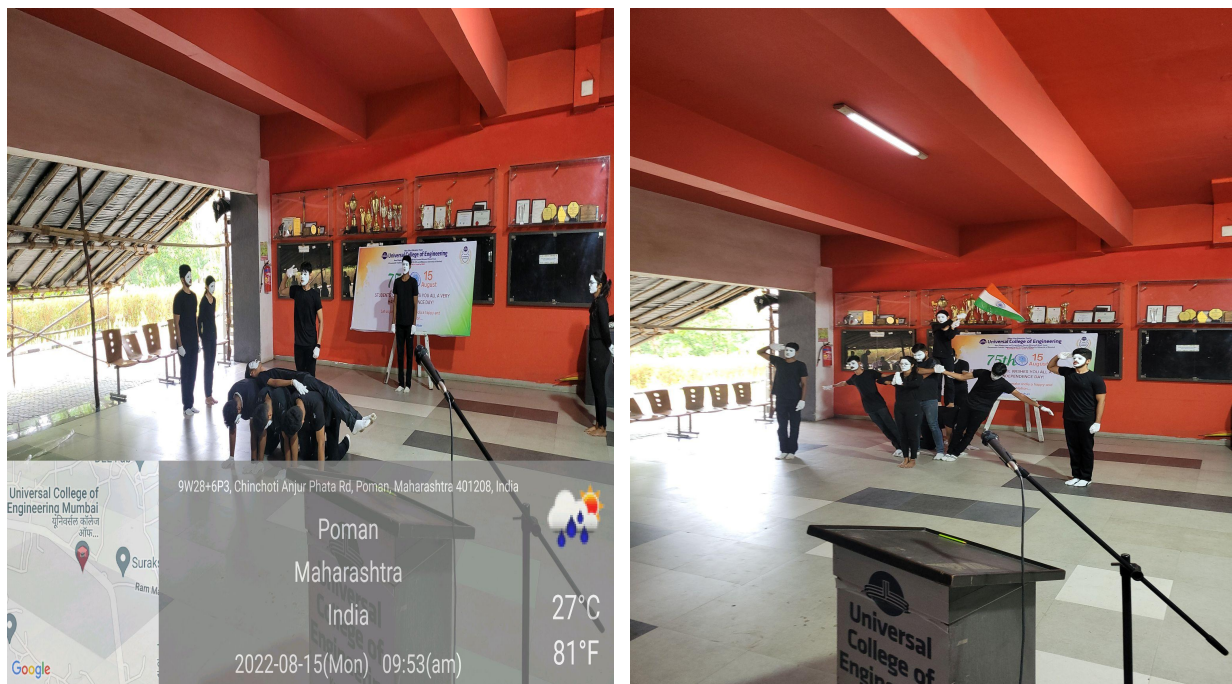
Amrit Mahotsav: Poster Making Competition

Poster Making Competition by the Team ACES participation of students from every department was seen in which two posters were selected as winner and runner-up Ashwin Singh (AMIL 3rd Year) & Vignesh Bhandar (AMIL 2nd Year). Their handmade Poster were submitted in survey lab and poster were displayed near the Admin Office Area on 15th August.



Independence Day Event

A great and a proud day for every Indian. Universal College of Engineering and Team ACES was all set to celebrate the Independence Day in the campus of UCOE. Many students were also accompanied with their parents and younger siblings to celebrate Independence Day. Student Council hosted this event and other student bodies along with team ACES also participated in the event. The event started with flag hoisting by the Campus Director, Dr. Jitendra Patil. The national anthem was then sung and everyone gave salutes to the flag. This was followed by a NSS (National Service Scheme) pledge. Then a beautiful welcome dance was performed by the members of Student Council. This was followed with performance of TE and BE students of civil engineering department who depicted the past stories of our nation's important events (India winning world cup in 1983, Mangalyaan mission, Pulwama Attacks) and a beautiful dance portraying the spirit of our nation. Then students of architecture performed a dance and then the Installation of the members of Student Council had started. This was followed with a speech of Joint GS of Student Council and the Ex-GS of Student Council. Then, Campus Director, Dr. Jitendra Patil gave a speech on the importance of Independence Day and motivated the students and faculties to be a better citizen. He also added that no General Secretary had been appointed for the student council, because he himself would be the general secretary of Student Council for the year 2022-23. The event was then concluded with the Vote of Thanks given by Khan Sir.

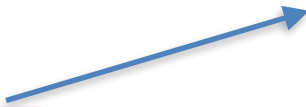


NEWS BULLETIN

Nano-engineered sealer promises more durable concrete



The novel sealer, developed by Washington State University, USA, showed a 75% improvement in repelling water and a 44% improvement in reducing salt damage in laboratory studies compared to a commercial sealer.



Researchers at the Indian Institute of Technology (IIT) have developed a comprehensive framework to reduce the damage to power transmission systems in coastal areas under cyclonic scenarios.

The researchers have used damage-cum-wind speed data of [cyclone Fani](#) in [Odisha](#) to develop a fragility model for towers to assess the functionality of the network and the influence of strategic interventions, according to a release issued by the IIT.



A Gujarat-based civil engineer, [Nikunj Trivedi](#), provides [free education](#) to children whose parents cannot afford tuition fees, on [Vadodara's](#) footpath.

Nikunj teaches underprivileged students of private and government schools on the pavement in Vadodara to spread awareness about the importance of education among children.

RELATED

Attractive scholarships, job opportunities across Europe drawing Indian students to Italy



Noida Supertech twin towers razed to ground: Watch the demolition from multiple angles

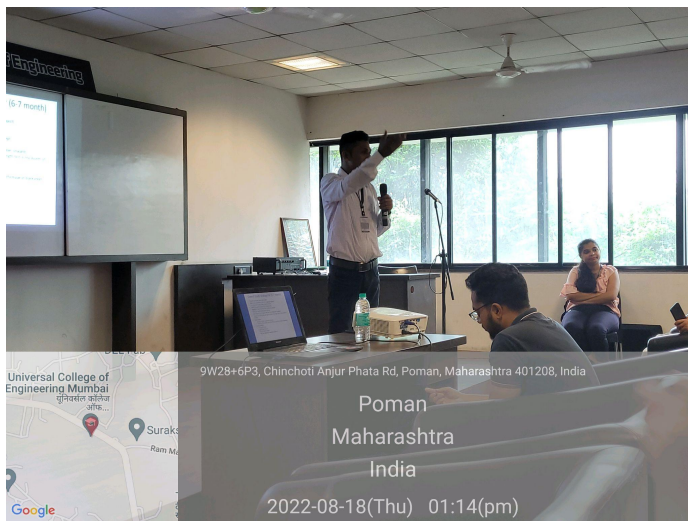
India on Sunday joined the club of countries that have razed buildings taller than 100 metres with the safe and successful demolition of the [Noida Supertech twin towers](#), said Joe [Brinkman](#) of South African firm Jet Demolitions.

The illegal twin towers in Noida's Sector 93A were grounded by waterfall implosion technique within 15 seconds on Sunday.

DEPARTMENTAL ACTIVITIES

GATE SEMINAR

Team ACES had organized an event for the students of Civil Engineering Department on how to prepare and crack the Gate Exam in January 2023. The Speaker Mr. Sachin Pawar is an expert who has completed his masters from IIT and had cracked GATE exam 3 times. THE EVENT STARTED WITH THE NATIONAL ANTHEM. Mr. Omkar Sankhe, the host of the seminar started the seminar by giving the introduction of our speaker Mr. Sachin Pawar, then the stage was passed to the speaker. Mr. Sachin Pawar gave introduction on gate exam as he had a good experience of the way the exam is conducted.



After a smooth introduction he discussed the key points like marks distribution, syllabus, strategies how to clear exam and the planning required to complete the syllabus in the next 6-8 months. He concluded the seminar by motivating the students to not lose hope and to be optimistic.

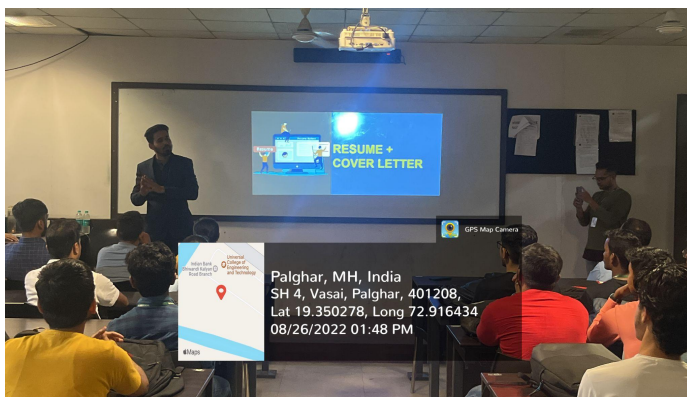
Our HOD Mr. Rajesh Dubey, felicitated Mr. Sachin Pawar by giving a small gift and ended the session by giving a vote of thanks to Mr. Sachin Pawar.



WORKSHOP ON RESUME BUILDING

Team ACES collaborated with IEI to host a workshop on resume writing. The workshop started with the students registering before entering the classroom and taking their seats. The host, Mr. Chirag Patel welcomed the HOD, faculties and all the students present and gave introduction of the qualified speaker we had and welcomed them to speak.

Mr. Mahindra Daima started the workshop by explaining the importance of cover letter and resume. He elaborated on how to write a proper CV and resume which will be helpful in the future to land a job. Then our respected HOD, Mr. Rajesh Dubey felicitated our speaker with a small gift and shared a few words of wisdom on the importance of a good resume. The workshop was then concluded by a vote of thanks given by IEI head, UCOE chapter Ms. Uzma Sheikh.



Upcoming Events:

- TANTROTSAV
(15th SEPT, 2022)
- JUNIOR VYRO
(17th SEPT, 2022)

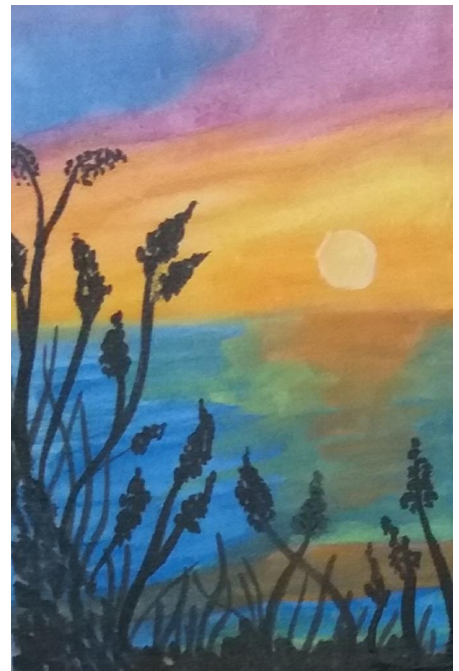
CANVAS



Manas Acharekar



Tulsi Nair



Hari Harsora

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