05/11/2025

ASCE INSIGHTS

"Without Sight there is no Insight"

ASCE CET STUDENT CHAPTER

MONTHLY NEWSLETTER

November Edition

VISION

To nurture civil engineering students to become future civil engineering leaders to serve the society.

MISSION

- **To foster student members from the fundamental to wider engineering knowledge.**
- **To adapt them with a broad set of skills and technical know how on the fields of emerging technologies and new developments in professional practices.**
- **To develop leadership and inquisitive attitude for creating innovative solutions to serve the society.**

EDITORIAL BOARD

The ASCE CET student chapter has always been a platform for aspiring civil engineers to learn, collaborate and grow beyond the classroom. Through ASCE INSIGHTS we have embarked on a new journey of learning and has given its readers access to relevant topics and news. In this 5th edition of our newsletter we have put special efforts to bring you excellent articles and diverse elements that could help nurture the builder in you and we are happy to release the edition on our foundation day 2025. We have shed light upon the trajectory of our club activities as well. May it serve as a reminder that every step we take as learners and Professionals is part of a larger journey towards building stronger, smarter and more sustainable communities.

-Lavanya.R.S, Laya Rose Jijoy

LAVANYA R. S.
CONTENT TEAM

LAYA ROSE JIJOY
CONTENT TEAM

Structures: Or Why Things Don't Fall Down – J.E. Gordon

This book is known for its simple, engaging and beginner-friendly explanation of the fundamentals of structures. One of its major features is that it explains complex engineering concepts such as stress, strain, bending, compression, tension, fatigue and material failure without using heavy mathematics. Instead, the author uses real life examples, historical references, natural structures and relatable analogies to make learning interesting and easy to understand. The book also highlights the importance of understanding why structures fail, which helps build strong engineering logic and intuition. Its humorous and narrative style makes the reading enjoyable, while still delivering deep insights into how structures behave and why they remain stable. These features make it an excellent foundational book for civil engineering students and anyone curious about the science behind strong and safe structures.

Foundation Day Special: The Journey & Impact of ASCE in Shaping the Future

ABOUT ASCE

ASCE Day celebrates the Society's founding on **November 5, 1852. Twelve esteemed engineers** gathered at **New York City's Croton Aqueduct** to establish what would become the American Society of Civil Engineers. This year marks ASCE's **173rd Anniversary.**

The American Society of Civil Engineers (ASCE) is one of the world's oldest engineering societies, established in **1852** in the **United States**. ASCE is dedicated to advancing civil engineering as a profession by promoting research, innovation, sustainability, and the development of future engineers. With members in more than 177 countries, ASCE plays a key role in shaping global infrastructure standards, publishing technical codes, and sharing knowledge across all major civil engineering domains.

U.S. stamp commemorating the 100th Anniversary of the ASCE in 1952

ASCE stands at the forefront of a profession that plans, designs, constructs, and operates society's economic and social engine – the built environment – while protecting and restoring the natural environment.

Through its active membership, ASCE is a leading provider of technical and professional conferences, continuing education &, the world's largest publisher of civil engineering content, and an authoritative source for codes and standards that protect the public.

1888 American Society of Civil Engineers at their 20th Annual Meeting at the Athenaeum Building

Its a strong organizational network spread across **94 Sections, 159 Branches, 12 International Groups, 416 Student Chapters, and 131 Younger Member Groups.** ASCE also works to enhance professional ethics, leadership skills, and public policy awareness among civil engineers. Through conferences, journals, technical committees, certifications, and community networks, ASCE supports life-long learning and global collaboration for civil engineers. For students, ASCE Student Chapters help to bridge the gap between academics and practical exposure by hosting competitions, seminars, field visits, and networking events, helping young engineers grow into impactful professionals.

The ASCE held its first meetings at the Croton Aqueduct Department building in City Hall Park. The meetings only went through 1855 and with the advent of the American Civil War, the society suspended its activities. The next meeting was more than twelve years later in 1867. On March 4, 1868, by a vote of 17 to 4, the name was changed to "American Society of Civil Engineers". Nora Stanton Barney was among the first women in the United States to earn a civil engineering degree, graduating from Cornell University in 1905. In 1996, ASCE relocated its headquarters from New York City to Reston, Virginia. The relocation to the Washington metropolitan area was made to bring ASCE's headquarters closer to the legislative branch of the federal government and also reduced operating costs.

Foundation Day Special: The Journey of ASCE CET STUDENT CHAPTER

Civil engineering is often called the mother of all engineering disciplines, for it lays the foundation upon which modern civilization stands. From the earliest irrigation canals and stone bridges to today's smart cities and sustainable infrastructure, civil engineers have played an indispensable role in human progress. Their work goes beyond the visible structures it represents the spirit of creativity, precision, and responsibility that keeps communities connected.

This day holds special meaning for all of us at the ASCE CET Student Chapter, College of Engineering Trivandrum, as it aligns closely with our own mission — to nurture the next generation of civil engineers who will carry forward this noble legacy. As a student chapter under the American Society of Civil Engineers (ASCE), we are part of a global network committed to advancing the field through knowledge, ethics, and service to humanity.

ASCE CET Student Chapter was formed at College of Engineering, Trivandrum on 2021, under the initiative of our Faculty Advisor, Dr. Anusha S. P and Practitioner Advisor, Dr. Kishor P and Abhijith. ASCE CET chapter was formed under the ASCE Southern Section, which has now grown to have a strong membership of more than 300 students from the department.

Over the year, the chapter conducted several impactful activities, including multiple panel members meetings to guide planning and decision-making. To enhance practical exposure and learning, the chapter organized field trips and webinars. In addition, students actively participated in competitions and hands-on workshops, all designed to foster technical skills, teamwork, and industry readiness among future civil engineers.

OUR COMMUNITY

The ASCE CET Student Chapter is a dynamic platform that unites aspiring civil engineers under the banner of the American Society of Civil Engineers (ASCE). With a strong membership of over 300 students, the chapter serves as a bridge between academic knowledge and professional practice, nurturing technical expertise, leadership, and innovation.

Under the guidance of experienced faculty and practitioner advisors, our chapter regularly organizes impactful activities such as panel discussions, technical workshops, webinars, site visits, expert talks, and competitions. These initiatives provide members with practical exposure, teamwork opportunities, and industry readiness, equipping them to face the challenges of the civil engineering profession.

Together, the ASCE CET Student Chapter forms a vibrant community dedicated to shaping not only better engineers but also responsible leaders for the future of civil engineering.

EXPERT GUIDANCE FOR OUR SUCCESS!

We sincerely thank our respected advisors, for their invaluable guidance and unwavering support towards the ASCE CET Student Chapter. Their expertise, encouragement, and steady mentorship have played a vital role in shaping our activities and vision. With their constant motivation and constructive feedback, we have been able to pursue meaningful initiatives that enrich both our technical knowledge and leadership skills. Their dedication continues to inspire us to uphold the values of professionalism, innovation, and excellence in civil engineering.

MEET OUR TEAM

DR. ANUSHA S. P.
FACULTY ADVISOR

DR KISHOR P.
PRACTITIONER ADVISOR

ABHIJITH S.
PRACTITIONER ADVISOR

SYAM S.
PRESIDENT

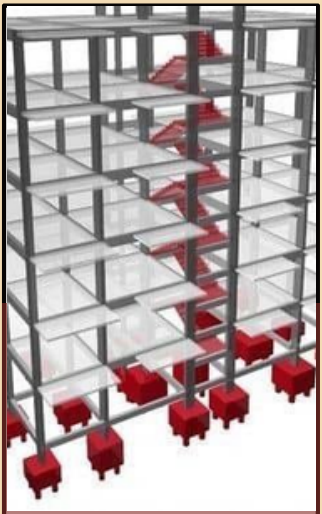
DEVANARAYANAN VINOJ
VICE - PRESIDENT

EVENT HIGHLIGHTS

PLAN MAKING COMPETITION

The ASCE CET Student Chapter proudly announced the outstanding success of the Plan Making Competition, an inspiring initiative aimed at nurturing the design and planning skills of the next generation of civil engineers. Guided by the timeless words of Lindon Leader — "Great design is born of two things: simplicity and clarity" — the competition challenged participants to think beyond conventional boundaries and translate creative ideas into practical, efficient, and aesthetically pleasing designs. The event witnessed enthusiastic participation from talented students who demonstrated exceptional innovation, attention to detail, and an admirable understanding of real-world engineering principles.

Heartfelt congratulations to our champions **Fathima Al Zahra Hameed** and **Fathima Nafla A N** from LBS College of Engineering, who secured the **1st Prize**, and **Benzila Benny, Noor Fathima A K, and Sangeeth A P** from M A College of Engineering, who achieved the **2nd Prize**. Their remarkable work stood out for its creativity, functionality, and precision, truly reflecting the essence of effective design and planning. The ASCE CET Student Chapter extends its warm appreciation to all participants for their passion and effort, and to the mentors and judges who made the event a resounding success. Together, we continue to celebrate the spirit of innovation, collaboration, and excellence in engineering.



ETAABS

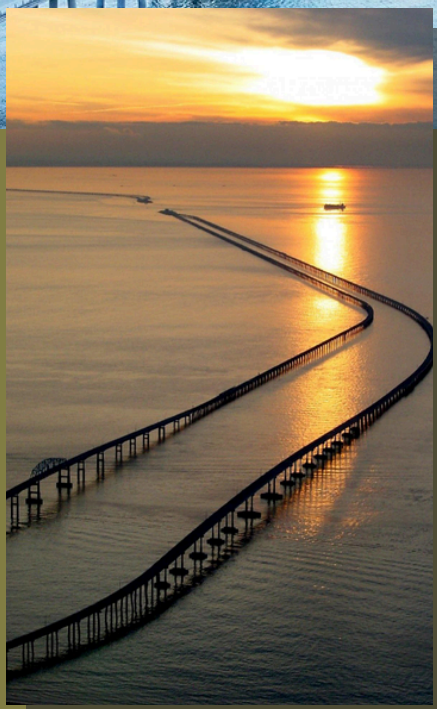
SOFTWARE SPOTLIGHT

ETABS **(Extended Three-Dimensional Analysis of Building Systems)** is a smart Tool for Future Engineers. It is one of the most popular software tools used by civil engineers to design and analyze buildings. Developed by Computers and Structures, Inc. (CSI), ETABS allows engineers to easily model structures, apply loads, and study how buildings respond to wind, gravity, or earthquakes.

What makes ETABS special is its simple interface and accurate results. Students can create 3D models, visualize stress and deformation, and connect classroom theory with real-world applications. It also supports Indian and international design codes, making it highly relevant for professional use across the globe for Projects of all scale and the world's tallest building the Burj Khalifa in Dubai was designed using ETABS.

CHESAPEAKE BAY BRIDGE–TUNNEL: A MODERN ENGINEERING MARVEL

The Chesapeake Bay Bridge–Tunnel (CBBT), officially the Lucius J. Kellam Jr. Bridge–Tunnel, is a **28.4 km** long structure located on the East Coast of the United States, connecting Virginia Beach to the Delmarva Peninsula. Completed in 1964, this iconic link stands as one of the most remarkable bridge–tunnel systems ever built and was once the longest of its type in the world until 2018. **The American Society of Civil Engineers recognized the CBBT as one of the Seven Engineering Wonders of the Modern World.**



Need & Initiation - Post World War II, ferry traffic across Chesapeake Bay rapidly increased due to population growth. By the mid-1950s, delays at ferries became unsustainable. In 1956, the Virginia General Assembly initiated the plan to explore a fixed crossing which eventually evolved into a unique combination of bridges, tunnels, causeways and man-made islands.

Design & Structure

The CBBT includes two 1.6 km tunnels, two high-level navigation bridges, 19 km of low-level trestle, 3.2 km of causeway, and four artificial islands each about 5.25 acres. Remarkably, throughout its 28.3 km length, the height difference between north and south ends is only around six inches. If placed end-to-end, the piles supporting the trestles would stretch nearly 160 km.

Construction

The project was financed entirely through toll revenue bonds—without the use of state or federal taxes. Construction began in October 1960 and faced extreme environmental challenges including hurricanes and nor'easters. Despite severe damage during the 1962 Ash Wednesday Storm, the CBBT was successfully opened to traffic in April 1964.

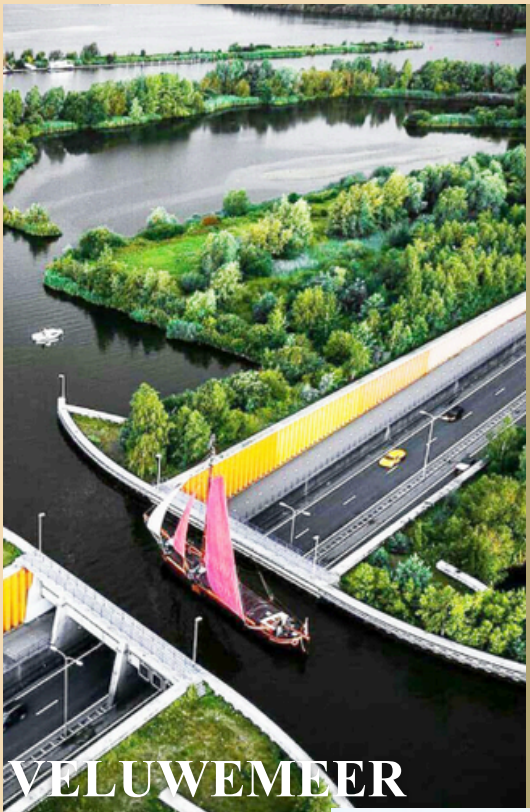
Expansion

Increasing regional growth demanded additional capacity. A parallel bridge system was completed in 1999, and a second parallel tunnel project began in 2017 using tunnel boring technology. Due to delays, completion is now expected by 2027.

CENTRE CONSIDERS CONSTRUCTING 37 STRATEGIC ROADS ALONG CHINA BORDER WORTH ₹13,000 CR

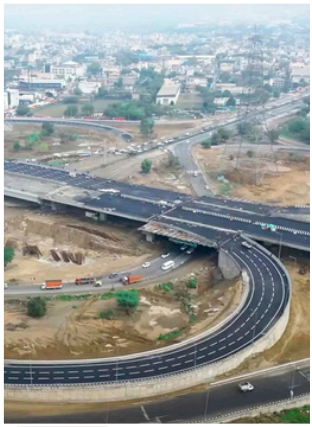
The government is considering on a proposal to construct an additional 37 roads spanning a total distance of 875 km along the India-China border, a report in a leading daily states. The proposed project, part of the India-China Border Roads (ICBR) programme, would cost approximately ₹13,000 crore.

According to the proposal, nearly 70% of the roads under ICBR-III would be built in the state of Arunachal Pradesh. The ongoing phases of the ICBR programme, namely ICBR-I and ICBR-II, involve the development of 1,435 km of roads in Ladakh, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh. The estimated cost of the project is around ₹1,600 crore. The ICBR project aims to enhance infrastructure along the border between the two nations by constructing strategic roads, bridges and tunnels.



VELUWEMEER AQUEDUCT

The Veluwemeer Aqueduct is the world's shortest and most interesting aqueducts in the world. A stunning water bridge and a creative solution to the Veluwemeer lake crossing, the navigable aqueduct crosses N302 road, near Harderwijk, in the east of Holland, Netherlands. The aqueduct was named after the lake it serves, while the lake was named after the Veluwe region of Gelderland, which is due south of the lake. The road, a scenic beauty and stunning work of engineering, connects mainland Netherlands to Flevoland the largest artificial island in the world. Flevoland was constructed from reclaimed land in the region and is surrounded by three man-made lakes. This island is actually made up of two drained sections, Flevopolder and Noordoostpolder, which come together to make up the 374.5 square miles (970 square kilometers) province of Flevoland. Dutch civil engineers and architects put in their creativity and came up with the brilliant idea of the aqueduct. In order to avoid spillage of water onto the road, aqueduct Veluwemeer uses 22,000 cubic meters of concrete to support the weight of the water above the roadway. It also uses steel sheet piling to prevent sediment from bleeding onto the highway. The bridge deck is made of prestressed concrete which allows the concrete beams to hold high loads of not only compression but also tension The aqueduct is 25 meters long and 19 meters wide with a water depth of 3 meters allowing small boats and other shallow-draft water vehicles to pass through, effortlessly. Along with the boats passage over the road, pedestrian walkways can be found on both sides, granting access for foot traffic to cross. The road itself also includes designated cycle lanes. The water bridge design allows for constant traffic flow both on the road and over the aqueduct. An average of around 28,000 – 34,000 vehicles pass each day underneath the aqueduct.



NEW CLOVERLEAF INTERSECTION, IN INDIA TO BE INAUGURATED SOON

Nitin Gadkari, Minister of Road Transport and Highways, will soon launch the Cloverleaf intersection which will connect NH-48, the Southern Peripheral Road and the Dwarka Expressway.

Union minister and Gurgaon MP Rao Inderjeet Singh stated that the cloverleaf is nearing completion after meeting Gadkari and discussing numerous projects related to the NCR area.

The cloverleaf has a circle of almost 2 km, including ramps on all four sides, according to the National Highways Authority of India. It is claimed to be a bigger version of the cloverleaf in Dhaula Kuan in New Delhi and is one of India's largest such constructions.

"Its construction is almost complete and it is expected to open to the public in coming weeks," the Gurgaon MP said, adding that Union minister Gadkari will inaugurate the cloverleaf and inspect the Dwarka Expressway work.

SUSTAINABILITY REVOLUTION: CARBON-NEUTRAL CONSTRUCTION & NEW MATERIALS

The Urgency of Carbon-Neutral Construction

The construction industry is responsible for nearly 38% of global CO_2 emissions, with a major share coming from cement, steel, and energy-intensive processes. Achieving carbon neutrality in construction means balancing emitted and absorbed carbon—either through greener materials, improved design, or carbon capture.

In response to climate targets such as Net Zero 2050, engineers across the world are rethinking every stage of a structure's life cycle—from material sourcing to demolition.

Decoding Carbon-Neutral Design - A carbon-neutral building minimizes or offsets emissions throughout its life cycle. Engineers achieve this through:

- Low-Carbon Materials – Reducing embodied carbon in cement, steel, and aggregates.
- Energy-Efficient Design – Passive cooling, daylight optimization, and renewable power integration.
- Construction Optimization – Prefabrication, modular systems, and digital design tools reduce waste and rework.
- End-of-Life Recycling – Material reuse and design for disassembly.

Lifecycle Assessment (LCA) tools such as Athena Impact Estimator, Tally, and OneClick LCA are now integral to sustainable project planning.

New-Generation Construction Materials

a) Green Concrete - Cement production contributes nearly 8% of total CO_2 emissions. Green concrete replaces a portion of Portland cement with:

- Fly Ash, Ground Granulated Blast Furnace Slag (GGBS), or Silica Fume.
- Emerging technologies use Carbon Cure, injecting captured CO_2 into concrete to enhance strength while trapping carbon permanently.

b) Geopolymer Concrete - A revolutionary material synthesized from industrial by-products such as fly ash or metakaolin.

- Offers 60–80% reduction in CO_2 emissions compared to OPC.
- Exhibits high compressive strength and chemical resistance—ideal for marine and infrastructure applications.

c) Recycled Aggregate Concrete -Use of crushed demolished concrete as coarse aggregate conserves natural resources and reduces landfill waste.

Improved crushing and screening processes now ensure comparable strength to conventional concrete.

d) Bamboo and Engineered Timber - Timber acts as a carbon sink, absorbing CO_2 during growth. Modern engineered forms such as Cross-Laminated Timber (CLT) and Glue-Laminated Beams are emerging as alternatives to steel in mid-rise structures.

Bamboo composites offer similar strength-to-weight ratios and excellent sustainability.

e) Self-Healing Concrete - Incorporates bacteria (Bacillus species) or microcapsules that release calcium carbonate upon cracking. This innovation extends the service life of structures and minimizes maintenance-related emissions.

FACTS

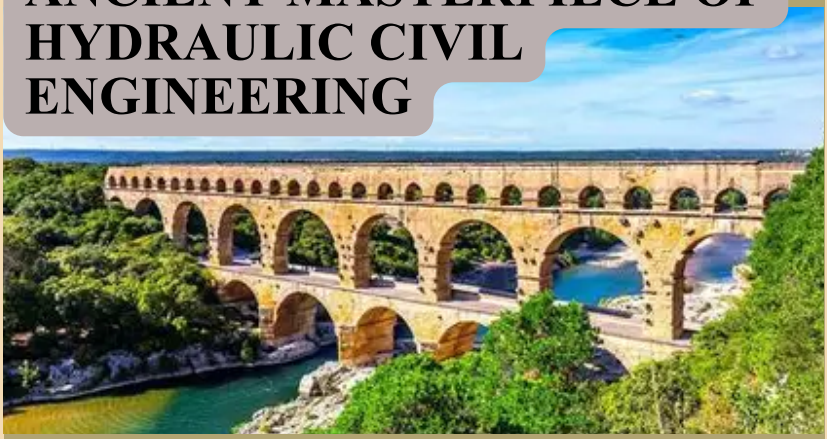
1 India's Golden Quadrilateral connects 13 major cities and covers 5,846 km, making it one of the largest highway networks in the world.

2 The Millau Viaduct in France is taller than the Eiffel Tower with a maximum pier height of 343 meters

3 The Burj Khalifa is so tall that the temperature difference between the base and top floors can be up to 6°C.

4 Engineers now use AI based structural prediction models to identify potential crack zones before they appear in real structures.

ROMAN AQUEDUCTS: THE ANCIENT MASTERPIECE OF HYDRAULIC CIVIL ENGINEERING



Roman Aqueducts represent one of the most advanced civil engineering achievements of the ancient Roman Empire. Constructed between 312 BC and the 5th century AD, these monumental water supply systems transported clean water from natural sources such as springs, rivers and mountains to cities that sometimes lay tens or even hundreds of kilometers away. Rome alone eventually had more than eleven major aqueduct lines feeding the city continuously, supporting a large population far ahead of its time. Their existence transformed Roman cities into highly urbanized and hygienic civil societies.

The most remarkable aspect of Roman aqueduct engineering was that they relied almost entirely on the principle of gravity flow. Engineers surveyed terrain with extraordinary precision, designing extremely gentle gradients that allowed water to travel long distances without mechanical pumping. In many aqueducts, the slope hardly deviated more than a few cm per km. This required deep understanding of natural topography, alignment, levelling and long-term flow behaviour — skills which even today demand specialised expertise in water resources engineering.

Construction methods used were also highly innovative. Aqueducts were built using multiple integrated structural forms such as underground tunnels carved through hills, stone masonry channels, brick-lined conduits and elevated arcades across valleys. They also included sedimentation basins to purify water before distribution and inverted siphon arrangements to cross uneven terrain. The material technology behind them was equally impressive — the Romans used lime-pozzolana cement which had exceptional durability and resistance to chemical deterioration. The Pont du Gard in France stands as living evidence of their material superiority, remaining structurally sound even after nearly two thousand years.

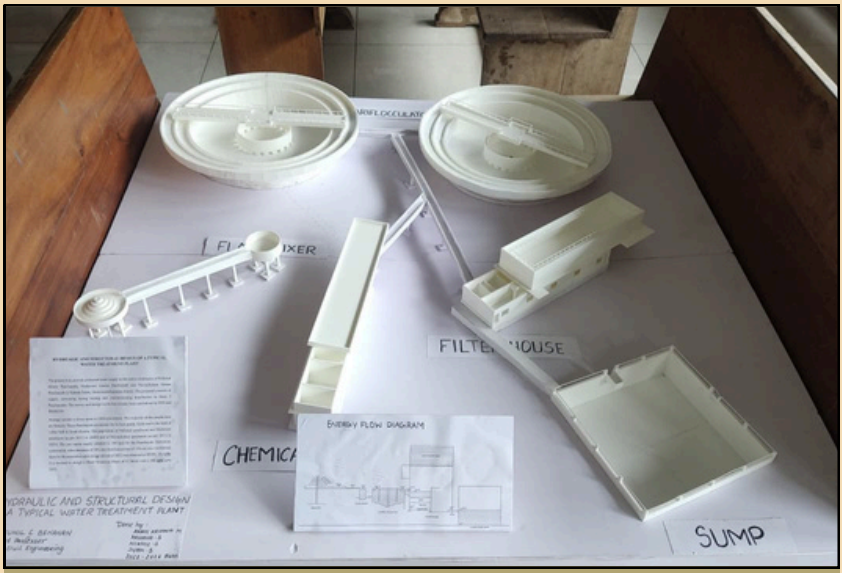
Beyond structural excellence, the aqueducts profoundly shaped Roman society. The steady supply of water supported public baths, fountains, latrines, domestic households and irrigation. This improved public health, sanitation, hygiene, comfort and urban development to levels unmatched by most civilizations of that period. Roman aqueducts therefore were not simply architectural marvels — they were critical civil infrastructure systems that powered social growth and economic stability. Their design principles continue to influence modern water supply, distribution networks and hydraulic engineering even today, proving that timeless engineering solutions can emerge even without modern machinery.

A tunnelled part of a 25 km Roman aqueduct built during the 1st century AD

The water conduit of the Tarragona Aqueduct, Spain.

Catchment basin of the aqueduct of Metz in France.

Urban distribution tank at Nimes, France.



3D PRINTED PROTOTYPE OF 12 MLD WATER TREATMENT PLANT

The 3D printing of the prototype of a 12 MLD water treatment plant was carried out as part of the B.Tech final year project of Syam S, Krishna S, Aakash krishna and Nikhil S of S7 C1, under the supervision of Prof. Sunil C. Behanan. The prototype was designed at a scale of 1:90 using SketchUp software and includes major components such as a cascade aerator, flash mixer, clariflocculator, clear water sump, filter house, and chemical house.

The alignment of the prototype was planned based on the energy flow diagram to ensure proper hydraulic functioning. The designed capacities of the major units are: flash mixer – 3.825 m³, flocculator – 228 m³, clarifier – 1500 m³, and clear water sump – 1200 m³. Various connecting channels of diameters 600 mm, 900 mm, and 1.5 m, as well as rectangular sections of 1 m × 0.7 m and 1 m × 0.9 m, were provided for flow conveyance. The work was completed using the 3D printing facility available in the Mechanical Engineering Department. A 1.75 mm white PLA filament was used, with a total consumption of about 4 kg. The total cost of production was approximately ₹6,000, and the entire process took around one month to complete.

HILTI INDIA HOSTED THE SEISMIC ACADEMY ANNUAL CONFERENCE 2025

Hilti India hosted the Seismic Academy Annual Conference 2025 at the India Habitat Centre, New Delhi, under the theme “Building Retrofits – Breathing Life into Existing Structures.” The event brought together engineers, policymakers, academicians, and industry leaders to address india's ageing infrastructure and strengthen its earthquake resilience roadmap. the seismic academy has engaged over 2500 stakeholders through workshops,training and research, influencing seismic code updates and advancing retrofit practises.The 2025 edition featured keynote sessions. Technical talks, case studies, student competitions and panel discussion involving leaders from CPWD, IIT DELHI, and CCEPL. "Our commitment through seismic academy has always been to make seismic safety not just a technical conversion, but a national priority" said Jayant Kumar, General manager and managing director Hilti India. Speakers including Dr. Shailesh Agrawal, Executive Director, BMTPC, and Prof. Vasant Matsagar of IIT Delhi, underscored the need for retrofitting, capacity building, and performance-based design to build resilient communities. Hilti's seismic academy continues to serve as a platform to research, collaboration and preparedness to build a safer and more resilient India.

WORD SEARCH

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

Bearingcapacity
Compaction
Voidratio
Consolidation
Settlement
Porosity
Permeability
Cohesion
Oedometer
Earthpressure

KNOW YOUR CODE

IS 962 – Code of Practice for Architectural Drawing

IS 962:1989 is a fundamental standard that provides guidelines for architectural and building drawings. It ensures uniformity, accuracy, and clarity in the preparation and interpretation of design drawings used in construction.. The code covers essential aspects like symbols, line conventions, lettering, scales, dimensioning, and layout of plans, elevations, and sections. It helps architects, engineers, and students maintain consistency and effective communication across design teams. Following IS 962 not only improves the quality of drawings but also prevents errors during construction. In short, this code is the language of design — clear, precise, and universally understood in the world of architecture and engineering.

GATEWAY TO SUCCESS

QUESTIONS OF THE MONTH

1.The degree of static indeterminacy of a plane frame depends on:

A) Number of joints and members only
B) Number of equilibrium equations only
C) Number of unknown reactions and member forces exceeding available equilibrium equations
D) Material properties of the structure

2. The liquid limit of a soil primarily indicates:

A) Compressibility of the soil
B) Shear strength at a specific water content
C) Permeability of the soil
D) Grain size of the soil

3. In a trickling filter, the main mechanism of organic matter removal is:

A) Sedimentation
B) Adsorption
C) Biological oxidation by attached microorganisms
D) Chemical oxidation using chlorine

4. Initial setting time of cement is defined as:

A) Time elapsed between mixing and start of hardening
B) Time when cement starts to lose plasticity
C) Time taken for cement to gain full strength
D) Duration required for final hardening.

5. The camber provided on road surfaces is mainly to:

A) Reduce the speed of vehicles
B) Drain off rainwater quickly
C) Improve appearance of the road
D) Increase road grip

Contact Us:

: asce_cet

: American Society of Civil Engineers CET

Articles are invited.
Please do scan the below attached
QR code and sent your article.