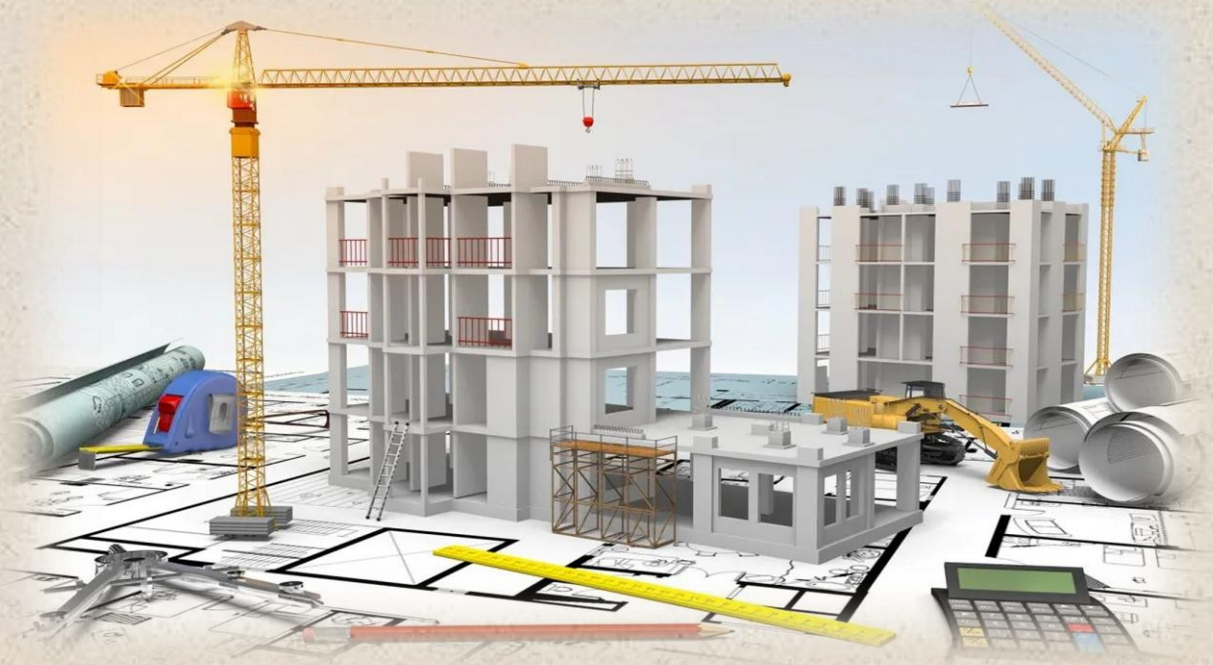
TECHNICAL MAGAZINE

2025-26



CIVIL ENGINEERING DEPARTMENT

VISION

- To carve and contribute to the society and the world at large, a group of civil engineers with excellent & high technical competency, who can give the best solutions to the current & future challenges in civil engineering.
- To provide an environment that promotes personal growth, self-confidence, urge for high esteem coupled with high moral and ethical values.

MISSION

- To provide students with upgraded technical knowledge through innovative teaching & learning processes.
- To provide interactive sessions with experienced technical experts.
- To associate students with the construction industry by way of taking up live projects with industry and expose them to the current scenario.
- To motivate them for research and development activities

PROGRAMME OUTCOMES

Engineering Graduates will be able to:

- PO1: Engineering Knowledge: apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- PO2: Problem Analysis: identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3: Design & Development of Solutions: design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

- PO4: Conduct Investigation of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

- PO5: Modern Tools Usage: create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations.

- PO6: The Engineer and Society: apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

- PO7: Environment & Sustainability: understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- PO8: Ethics: apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

- PO9: Individual & Team work: function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

- PO10: Communication: communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

- PO11: Project management & Finance: demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

- PO12: Life-long Learning: recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

- Students will be able to carry out planning, design, and preparation of all sets of drawings of various small civil engineering projects and manage the construction activities with skill, adhering to the principles learnt during the programme.
- Students will be confident to undertake various projects as entrepreneurs.
- Students will be able to innovate research projects as per the needs of society

ABOUT THE DEPARTMENT

The Department of Civil Engineering began its journey in 2011 with a humble start. Today, it proudly boasts eight fully equipped laboratories, a dedicated team of 09 faculty members, of which three are pursuing PhDs, and four are supporting staff, all working tirelessly towards excellence. Our mission is to contribute to society and the nation by shaping competent civil engineers with strong ethical values.

The department emphasises practical learning by organising site visits, industrial tours, and internships to bridge the gap between academics and industry. Faculty members actively participate in national and international conferences and publish papers in reputed journals.

We are associated with professional bodies such as ISTE, ASCE and students excel in competitive exams like GRE, TOEFL, and GATE, securing admissions to prestigious universities. Students also participate enthusiastically in technical fests, sports, and cultural activities at both the college and inter-college levels. The Civil Engineering Students' Association (CESA) plays a key role in coordinating these events.

Our young and energetic faculty team guides students in developing BE project work and technical models in Civil Engineering Structures.

Additionally, a one-week ISTE-sponsored STTP is conducted annually at the department and college levels to enhance the professional skills of faculty members within and outside the department.

FROM PRINCIPAL'S DESK:

Dear All,

It gives me an immense pleasure to welcome you to VIVA Institute of Technology, Virar affiliated to University of Mumbai, governed by Late Shri. Vishnu Waman Thakur Charitable Trust's. We believe in the fact that "Education is a journey from Information to Knowledge and from Knowledge to Wisdom. The Engineering graduate should be capable of applying knowledge to real-time engineering problems and provide solutions, which are technically sound as well as economically viable. Only creative minds can accomplish this task.

A Newsletter mirrors the success story of an institution and acts as a great medium to reach out to the outer world. It reflects upon the persistent and committed efforts made by faculty and students for taking the institution one step ahead. Continuing the same tradition, this issue of

the newsletter reflects upon commendable contributions made by all members of the civil engineering department in their fields of expertise as well as for the overall growth of the institute. I congratulate everyone for their value-adding work for the institution and do expect the same in times to come. I also congratulate the editorial team for bringing out the present issue of the newsletter.

VIVA INSTITUTE OF TECHNOLOGY nurtures a unique system of education for creating dynamic leaders in the corporate sector, entrepreneurs, academicians, researchers and professionals who contribute to the development of society and nation at large. It has an aesthetically designed and elegantly built campus furnished with state of art equipment and facilities. Here, education is not only focusing on 4 years B.E. degree course but also creating for the students a platform to realize their dreams, hone their cognition, sharpen their competence and carve out a wholesome personality.

Wishing you all the best for the fruitful learning journey at VIVA Institute of Technology and for a bright future!

FROM H.O.D.'S DESK:

Dear All,

Civil Engineering Department continues its journey toward excellence, and the dedicated efforts in student training stand as a testament to our growth and commitment to quality.

We, as a department, are happy to bring out this bulletin for this term 2024-25, during which the humble efforts of our faculty members are recognised. This will surely take our students to commendable heights in the field of higher education and entrepreneurship.

We believe in excellence with ethics and are very particular in striving towards the same. We begin to realize the fact that any technical lacuna today is like a credit card: "enjoy today and pay later.

Many of our students are from lower middle-class families who have a lot of hidden potential in them but really struggle to come to good positions to support their families. Some of our students made commendable beginnings that are useful to the Public by developing economical construction materials, which even earn them patents.

Our frequent field visits, yearly surveying project, drawing project and frequent guest lectures by eminent speakers are remarkable memories for them. They are given opportunities inside the classrooms to express their talents in the language and style of their heart.

I am sure that we can make commendable contributions to society which will lift the name of our college high in the near future.

IDXEX

FACULTY ARTICLES

Mr.Akshay Mistry

ME Structural Engineering, Ph.D. Pursuing

HOD, Civil Engineering Department

REACTIVE POWDER CONCRETE

The continuous advancement in construction technology has driven the development of materials that are not only stronger but also more durable and sustainable. Among these modern materials, Reactive Powder Concrete (RPC) stands out as one of the most innovative and highperforming types of concrete developed to date. Emerging in the early 1990s through extensive research and experimentation, RPC represents a revolutionary improvement over traditional and even high-performance concretes. It achieves unparalleled mechanical strength, durability, and structural efficiency by refining the basic components of concrete and optimizing their behaviour at the microstructural level. Unlike conventional concrete, Reactive Powder Concrete eliminates the use of coarse aggregates entirely, relying instead on an optimized blend of ultra-fine powders, including Portland cement, very fine silica fume, quartz flour, and fine sand. This unique composition, combined with low water-to-binder ratios and the incorporation of high-strength steel fibres, results in a remarkably dense and homogeneous microstructure. The absence of coarse aggregates minimizes weak zones within the concrete matrix, significantly enhancing its mechanical properties. Through meticulous material selection and particle packing, RPC achieves compressive strengths often greater than 150 MPa, with some specialized formulations reaching up to 800 MPa under laboratory conditions. Furthermore, its tensile strength, impact resistance, and durability under harsh environmental conditions far exceed those of conventional concretes.

RPC's outstanding durability characteristics—such as low permeability to water and aggressive chemicals, excellent freeze-thaw resistance, and superior resistance to chloride ion penetration—make it highly suitable for critical structures exposed to severe conditions. Its high performance enables the design of thinner, lighter, and more elegant structures while

maintaining or even enhancing load-carrying capacities. As a result, RPC finds applications in a wide range of fields including bridge decks, precast structural elements, architectural facades, military installations, blast-resistant structures, and retrofitting projects. The production of Reactive Powder Concrete, however, requires precise material control, specialized mixing procedures, and often the use of external treatments such as heat curing to achieve optimal performance. While these requirements can lead to higher initial costs compared to traditional concretes, the long-term benefits in terms of reduced maintenance, extended service life, and overall sustainability often justify the investment.

Mrs. Ramya Raju

Assistant Professor

ME. CEM, Ph.D Pursuing

Mental Distress

A healthy workplace is essential for the growth, confidence, and productivity of every employee. In educational institutions, teachers and staff are expected to work in an environment based on respect, fairness, and professionalism. However, when mental harassment occurs, it can seriously affect an employee's well-being, job performance, and career development. Mental harassment refers to repeated behavior that causes emotional distress, humiliation, fear, or psychological pressure. In a college setting, an HOD holds a position of authority and is responsible for guiding faculty members and maintaining a positive work environment. Unfortunately, when this authority is misused, it can result in mental harassment. Such behavior may include constant criticism, public humiliation, unfair workload distribution, threats regarding job security, biased performance evaluations, exclusion from important meetings, or denying opportunities for professional growth.

The effects of mental harassment are far-reaching. A faculty member who experiences continuous stress and intimidation may suffer from anxiety, depression, loss of confidence, sleep disturbances, and reduced motivation. Over time, the quality of teaching, research, and interaction with students may also decline. A hostile work environment not only harms the individual but also affects the overall atmosphere of the college. It can lower staff morale, increase conflicts, and reduce teamwork and institutional productivity.

Several factors contribute to workplace harassment. These include misuse of authority, favoritism, lack of accountability, poor communication, and the absence of an effective grievance redressed mechanism. In some cases, victims remain silent because they fear retaliation, negative performance reports, transfers, or damage to their professional reputation.

Educational institutions have a responsibility to prevent and address workplace harassment. Colleges should establish clear policies against bullying and mental harassment, provide confidential complaint mechanisms, and ensure that every complaint is investigated fairly and impartially. Training programs on workplace ethics, leadership, and respectful communication should be conducted regularly for administrators and faculty members. Transparency in decision-making and performance evaluation can also reduce opportunities for misuse of authority.

Mrs. Pratibha Patil

Assistant Professor

ME. CE&M

WOMEN EMPOWERMENT

Women empowerment means giving women the freedom, rights, opportunities, and confidence to make their own decisions and participate equally in every aspect of society. Education is one

of the most powerful tools for empowering women. Women empowerment benefits not only women but society as a whole. When women are empowered, families become stronger, economies grow, and communities become more inclusive and prosperous. Women empowerment in workspaces means creating an environment where women have equal opportunities to grow, lead, and succeed in their careers. It involves ensuring fair hiring practices, equal pay for equal work, safe working conditions, and freedom from discrimination. An empowered workplace values talent and skills rather than gender.

Women empowerment in the family means ensuring that women have equal rights, respect, and opportunities to participate in decisions that affect their lives and the well-being of the household. Empowering women in the family is the foundation of a progressive society.

Mrs. Asmita Mhatre

Assistant Professor

ME.Water Resources

Respect and Professionalism

Women empowerment in the family means ensuring that women have equal rights, respect, and opportunities to participate in decisions that affect their lives and the well-being of the household. Empowering women in the family is the foundation of a progressive society.

College is a place where students learn not only academic subjects but also values such as respect, responsibility, and professionalism. One important aspect of college life is maintaining a respectful relationship with faculty members. Female faculty members deserve the same courtesy, dignity, and professional behavior as all educators. Building a respectful and positive relationship with them creates a healthy learning environment and reflects a student's character.

The first and most important rule is to treat female faculty members with respect. Address them politely using appropriate titles such as "Professor," "Ma'am," or the title they prefer. Listen

carefully during lectures, avoid interrupting, and wait for the right opportunity to ask questions. Showing respect through your words and actions demonstrates maturity and appreciation for their role as educators.

Maintaining professionalism is equally important. Conversations with faculty should remain focused on academics, career guidance, or other appropriate college-related matters. If you need help with assignments or projects, communicate clearly and politely. Avoid making personal comments about a faculty member's appearance, clothing, or private life, as such remarks may be uncomfortable or inappropriate.

Good communication also plays a significant role. When sending emails or messages, use polite language, write clearly, and include a proper greeting and closing. During face-to-face interactions, speak confidently but respectfully. If you disagree with a teacher's opinion or grading, express your concerns calmly and respectfully rather than arguing or becoming disrespectful.

Respecting personal and professional boundaries is essential. Do not expect special treatment or attempt to become overly familiar with any faculty member. Follow college rules regarding appointments, office hours, and communication channels. If a faculty member is busy, be patient and wait for a suitable time to discuss your concerns.

Students should also demonstrate honesty and responsibility. Complete assignments on time, avoid cheating or plagiarism, and attend classes regularly. Responsible behavior earns the trust and respect of faculty members and contributes to academic success.

Ms.Purva Awari

Assistant Professor

M.E.CEM

WORK LIFE BALANCE IN ENGINEERING COLLEGES

Engineering college is exciting. Projects, labs, coding rounds, fests, internships — and somewhere in between, there's supposed to be "you". But most of us end up living on 4 hours of sleep, caffeine, and deadlines. That's not sustainable.

Engineering teaches problem-solving. But if we're exhausted, anxious, or constantly comparing ourselves, our creativity drops. Burnout doesn't just hurt grades. It hurts health, relationships, and motivation. Companies today don't just hire coders. They hire people who can manage pressure without breaking.

Practical ways to build balance in college
- Time-block, don't just to-do list
Put classes, study, gym, friends, and sleep on your calendar. Treat sleep like a lab — non-negotiable. 7-8 hours makes you code faster the next day.
- One hobby that's not resume-related
Music, cricket, painting, trekking. Something with zero KPIs. It resets your brain and prevents burnout during vivas and placements.
- Social battery matters
Engineering can get isolating. Keep 2-3 people you can talk to honestly. Clubs, fests, and hostel nights aren't a distraction. They're part of mental health.

- Learn to say no
You can't be in 4 clubs, 3 projects, and 2 competitions every semester. Pick 1-2 things and go deep. Quality > quantity.
- Check in with yourself weekly
Ask: Am I sleeping? Eating? Stressed all the time? If the answer is no for 2 weeks straight, talk to a mentor, counselor, or friend. Most colleges now have a counseling cell. Use it.
The goal of engineering isn't just a job at the end. It's to build a career you can sustain for 40 years. That means learning how to work hard and recover. The best engineers aren't the ones who grind non-stop. They're the ones who know when to pause, debug their life, and come back sharper.

Mrs. Arathy H Menon

Assistant Professor

ME. CE&M, Ph.D.Pursuing

Soil Stabilization

In recent years, major settling or tilting of buildings and bridges, instability of dams and road embankments have been observed and many attempts have been made in order to mitigate such damages. The behavior of expansive soils is uncertain when subjected to moisture changes. The strength properties of these soils change according to the amount of water contained in the voids of the soils. The movement of water into and out of the soil voids induces severe swell shrink behavior causing stress levels which could result in damages to facilities placed on them. Highway facilities in particular stretch over considerable distances traversing diverse soil formations. The chances of encountering expansive soils are therefore high with highway facilities. Expansive soil behavior is generally attributed to clay soils, and is characterized by excessive compression, dispersive behavior, collapsing behavior, low shear strength, high swell potential, and frost susceptibility. They are therefore not suitable for use without improvement of their properties. For many years, civil engineers are faced with a great challenge to design structures on soft compressible soils which include soft clay, silt and peat foundations. Consolidation of water-saturated, fine-grained soil occurs very slowly because the low permeability of these soils impedes the escape of pore water from the soil voids. Such soils have poor drainage and strength properties. Even under large temporary surcharge loads, settlement can take years because of this slow water movement and the great distance the water must move to exit the soil. To increase the soil stability based on the requirement of economic cost, there are numerous methods of soil improvement methods according to the geological conditions, soil types and environments may be implemented.

Electro kinetic stabilization in programmable soil involves applying an electric field across the soil to control the movement of charged particles, ions, and water. This process enhances soil strength, reduces moisture, and improves stability. In programmable soil, the electric field can be intelligently controlled using sensors and feedback systems, allowing soil properties to adapt dynamically to changing conditions making it a smart, self-regulating ground improvement system.

Electro kinetic stabilization works by applying a direct electric current through electrodes placed in the soil. The electric field causes water and charged ions to move a process

known as electro-osmosis and electro migration. This movement reduces moisture, rearranges particles, and triggers chemical bonding that increases soil strength. At the same time, reactions near the electrodes change the soil's pH, improving stability. In programmable soil, sensors and controllers adjust the electric field automatically, making the soil smart and self-stabilizing.

Electro kinetic stabilization is primarily used to improve the engineering properties of weak, fine-grained, or highly plastic soils such as clays and silts. By applying a low-voltage electric current through electrodes inserted into the ground, it helps in removing excess pore water, realigning soil particles, and promoting chemical bonding. This leads to significant improvements in shear strength, bearing capacity, and overall stability of the soil. It is especially beneficial in places where conventional stabilization methods like compaction, drainage, or grouting are ineffective or difficult to apply. This technique has wide applications in foundation improvement, slope stabilization, soft clay embankments, and ground dewatering. It is also used in environmental remediation to remove contaminants such as heavy metals from polluted soils through electro migration. In modern practice, when combined with sensors and automated control systems, electro kinetic stabilization forms part of programmable or smart soil systems, allowing real-time monitoring and adaptive soil strengthening for advanced geotechnical engineering projects.

Kalpesh Patil

Assistant Professor

ME Environmental Engineering

Water Analysis on Physiochemical Parameters

Water is the second most imported need for life to exist. As a result, Water quality has been described extensively in the scientific literature. The most popular definition of water quality is the physical, chemical, and biological characteristics of water. Water quality is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. Water from any source may contain various suspended, colloidal and dissolved impurities which may be harmful or useful for drinking purposes. The process of removal of undesirable matters and pathogens from water is called the water treatment process. Now days advance domestic water purifier are used almost in

each & every house, according to quality of water of that area and also the standard of living of that locality. In this study we have use domestic purifier in which having the inlet & out-let the arrangement for well-functioning. Two different techniques are used for determining the efficiency when filtering liquids, respectively identified as the single-pass test and the multi-pass test, but in this study we try to observe the efficiency with traditional method, we take two samples with three trail for each sample collected with span of interval time and collect the treated water and untreated water, by the quantity of this collected water we can judge the efficiency of the domestic water purifier and its observed that approximately 70% to 75% of water were waste in the purifying process of if not reuse. Although these tests have much in common, there is a significant difference in the particle size distribution presented to the filter, which may significantly affect the stated efficiency of the medium. In Efficiency of filter water Filtration Efficiency(FE), and Viral Filtration Efficiency(VFE), Particle Filtration Efficiency (PFE), Bacteria Filtration Efficiency (BFE) and Viral Filtration Efficiency (VFE) are different types of treatment are used in domestic purifier.

Selection of location & parameters is solely depending upon the purpose that we going to use and what extent we need its quality and purity of that water. Water sample one does content different types of floating, dissolved, suspended and microbiological as well as bacteriological impurities, If this water use for drinking purpose without any treatment it is harmful. So we recommended treat or disinfect the water before the use for drinking. In sample two there are maximum parameters are in permissible limit without any treatment. In study it is also observed that 70 to 75 % water go waste through outlet discharge pipe as non-purified water, which should be collect & reuse for different purpose and also recommended to use efficient purifier which gives the low discharge of untreated waste water.

STUDENTS CREATIVITY

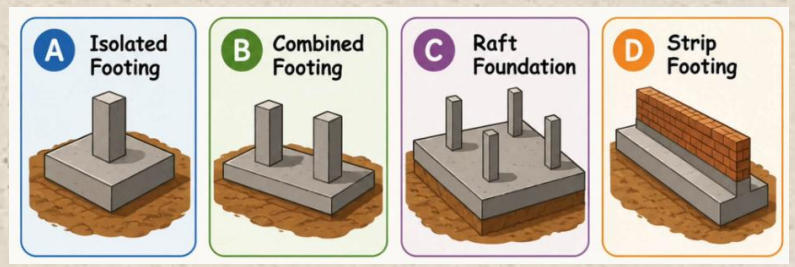
Art by Mr. Chirag Shejal, SE Civil Engineering

Quiz Time...

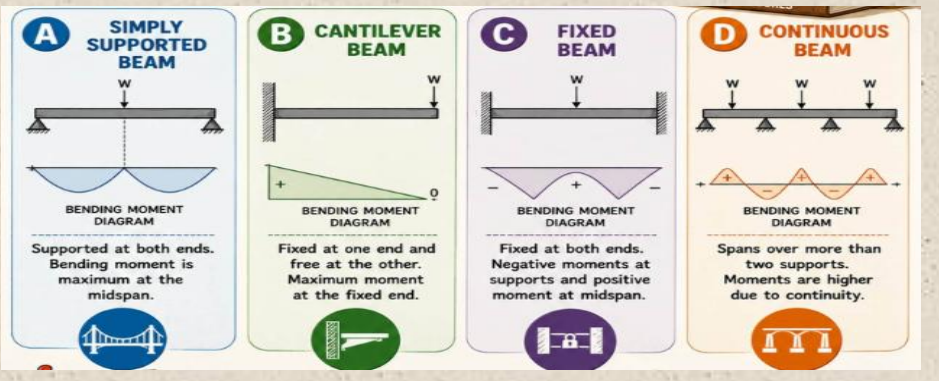
4. **Which survey instrument measures horizontal and vertical Angles?**

5. **Which cement gains strength faster?**

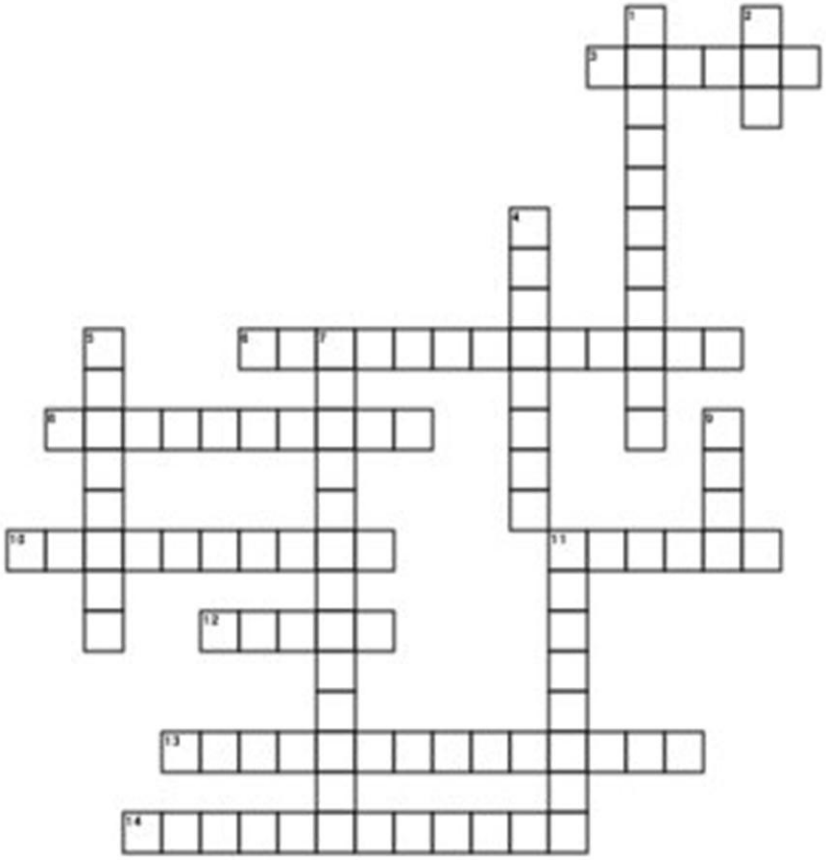
6. **Which foundation is best for weak soil?**



7. **Which beam carries the highest bending moment?**



Civil Engineering



Across

[3] A type of material used in construction that is made by mixing cement, sand, and water.

[6] The measurement of the strength of a material.

[8] A type of bridge that is supported by cables anchored at both ends.

[10] The base upon which a structure is built; it distributes the load of the structure to the soil below.

[11] This structural element is used to support vertical loads in buildings.

[12] A type of construction material that is made from heated clay.

[13] A device used to measure the distance between two points.

[14] The science of designing and constructing buildings and other structures.

Down

[1] The force that squeezes a material together.

[2] The software used in creating a computer generated model.

[4] A system that is used to collect and remove wastewater from buildings.

[5] A structure that is built to carry water over an obstacle.

[7] Steel bars or mesh added to concrete to increase its strength and durability.

[9] A structural member that is used to support weight, typically in a building or bridge.

[11] Road construction material that is made from a mixture of gravel, sand, and cement.