Vidyavardhini's College of Engineering & Technology
K.T. Marg, Vasai (W).

CIVIL TODAY

VOLUME-I, ISSUE-I DEC 2019

INSIDE THIS ISSUE

Precast Concrete Structures

Precast concrete is an alternative to *cast-in-situ* concrete. While cast-in-situ concrete is cast in its actual location, precast concrete is cast at another location, either at the building site or in a factory, and is then lifted to its final resting place and fixed securely. This means that unlike cast-in-situ construction, which is monolithic or continuous, precast concrete buildings are made of separate pieces that are bolted or connected together.

Advantages of Precast Construction:

- The construction is done on the ground rather than at a height
- It can be done inside a climate-controlled structure, eliminating problems of rain, dust, cold, or heat
- Specialised formwork (moulds) can be built for doing many repetitions of the same component
- Specialised equipment can be used to make, move, and pour the liquid concrete
- Curing of the concrete can be done in a controlled environment

This means that the quality of precast components can be very high. Since the components can be made beforehand, construction **can be very quick**. In cast-in-situ construction, engineers have to build each set of components after the previous set has finished, which does take time, as concrete generally takes 28 days to reach its full strength.

Dis-advatanges of Precast Construction:

- Since each piece is made separately, the structural frame or system is not monolithic or continuous like regular concrete construction. The joints between pieces create structural discontinuity. The forces of the building will pass through these joints, so they have to be designed to transfer these forces safely and properly. Note that precast concrete can be used for non-structural members too.
- Again, as the building is made of discrete components, the joints between adjacent members have to be sealed with special sealants to make them water-proof
- Each precast component is usually large and heavy. This means that cranes are required to lift them in position; these cranes are required to operate over the entire building volume. Since there will only be a few cranes at site, the time taken by the cranes to pick up a piece and shift it to its final position becomes critical in determining the building schedule.

-Mr. Jaydeep Chougale
(Asst Prof. Civil Engg Dept.)

ABOUT US:

Vidyavardhini's College of Engineering and Technology, Vasai is located on the sprawling campus of Vidyavardhini, spread over an area of 12.27 acres. It is a short, two minutes walk from Vasai Road (W) Railway Station. The college is also accessible by road from Mumbai. Vidyavardhini Society received approval from AICTE to start the new college of Engineering & Technology with effect from July, 1994. The college is affiliated to the University of Mumbai for the four year degree program leading to the degree of Bachelor of Engineering.

VISSION:

To be a premier institution of technical education, aiming at becoming a valuable resource for industry and society.

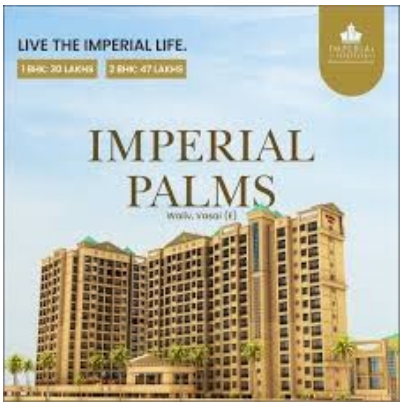
MISSION:

- To provide technologically inspiring environment for learning.
- To promote creativity, innovation, and professional activities.
- To inculcate ethical and moral values.
- To cater personal, professional, and societal needs through quality education.

INDUSTRIAL TRAINING

List of companies Providing Industrial Training to our Students:

1. Walplast Foundation of Trust
2. C.H.Patil and Sons
3. Krupa Mehta Consulting Engineers
4. Imperial Palms
5. Rajlaxmi Developers



INDUSTRIAL PLACEMENTS

The goal of industrial training is to expose students to actual work in an industrial setting while also allowing them to learn through practical application and job performance. With this view-point the department along with placement cell is taking initiative to provide Industrial training to students. The companies that has offered internship to our students in this academic year are:

STUDENT DEVELOPMENT ACTIVITIES

"Learning is a treasure that will follow its owner everywhere." Expert technical lectures at colleges and universities teach students a lot. For the benefit of the learners, experts in their particular technical fields provide their knowledge through–

Expert technical lectures.

1. Er. Prahlad V Rao delivered lectures on "Software training on *Estimation and Costing Using Easy Bids*".
2. Expert seminars on *"Software Applications in Various aspects of Construction Industry"*

INDUSTRIAL VISITS

Civil engineer is nothing without its practical application. For the growth of the student , department have organized various industry visit for the students which gave students an outside approach to the world of knowledge. In this context

1. Visit to **Gargoti Museum, Nashik** was taken for all the SE students to make them understand about various stones and minerals. In the museum there were minerals and there place of origin were studied.

STUDENTS' ACTIVITY & ACHIEVEMENTS:

- **Leon Gonsalves** successfully completed AIESEC leadership development Experience through a Global Volunteer Opportunity tackling the Sustainable Development Goal Reduced Inequalities at Kyiv, Ukraine.
- **Pranay Jadhav, Sarthak Yadav, Kushagra Goel, Abhishek Vishwakarma secured 1st** Prize in "Brain Teaser" Competition organized by Civil Engineering students Association (CESA) of our college.
- **Yogita Alave, Sanika Mahimkar and Hansashree Pawar** secured Runner Up position in "Brain Teaser" Competition organized by Civil Engineering students Association (CESA) of our college.
- **Darshan Mehata, Safiuddin Halim , Gurpreet Marwaha** secured 1st Prize in Quiz (Civil War) held at St. John College of Engineering and Management, Palghar
- **Darshan Marwaha, Safiuddin Halim , Gurpreet Marwaha** participated in " Bridge making competition" held at St. John College of Engineering and Management, Palghar.
- **Omkar Bhoir, Jidnyesh Mhatre, Harshal Chavan and Yogesh** Pawar secured 1st Prize " Building Planner" Competition organized by Civil Engineering students Association (CESA) of our college.
- **Shashank Shetye, Paras Vairagade, Pakshal Shah and Lovelesh Khatarkar** secured Runner Up position in "Building Planner" Competition organized by Civil Engineering Students Association (CESA) of our college.
- **Pranay Jadhav, Sarthak Yadav, Kushagra Goel, Abhishek Vishwakarma** secured Runner Up position in "Building Planner" Competition organized by Civil Engineering students Association (CESA) of our college.
- **Kushal Patel, Sandesh Uttekar, Shreya Ghosalkar, Abhishek Parmar** had qualified the Zonal Level and participated in the university level for the Avishkar Competition by Mumbai University.

.

FACULTY ACTIVITY & ACHIEVEMENTS

- **Mrs. Puja Kadam** published paper "Treatment of Leachate using Hybrid Constructed Wetlands- A Review Paper" in International Journal of Emerging Technologies and Innovative ResearchVol-7, Issue 4, ISSN: 2349-5162
- **Mrs. Puja Kadam** published paper "Comparative Analysis of Microbial Fuel Cell Performance fed by Different Wastewaters- A Review" in International Research Journal of Engineering and Technology (IRJET) Vol-7, Issue-4, p-ISSN: 2395-0072, e-ISSN: 2395-0056
- **Mr. Viren Chandanshive** has participated and presented a paper entitled, "Application of Artificial Neural Network in Environmental Engineering", in Vidyavardhini's National Conference on Technical Advancements for Social Upliftment held in our college
- **Mr. Viren Chandanshive** published paper "Estimation of Building Construction Cost Using Artificial Neural Network" in Journal of Soft Computing in Civil Engineering Volume 3, Issue 1, Winter 2019, Pages 91-107
- **Mr. Jaydeep Chougale** has participated and presented a paper entitled, "Study on Seismic Vulnerability Index Methods for Reinforced Structures" in International Conference on Emerging Trends in Engineering & Science (ICETES) JCON.

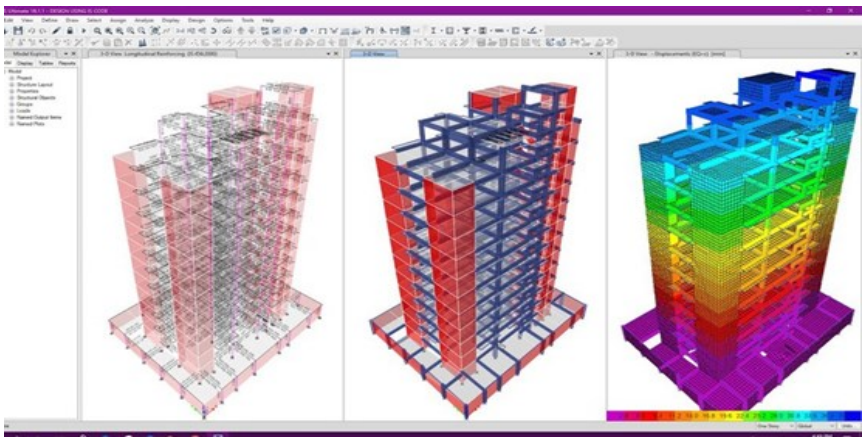
Seminars/Workshops/STTPs/Orientation Programs

SR. NO	TYPE OF PROGRAM	NO. OF COURSES	NAME OF FACULTY	DURATION
01	AICTE APPROVED FDP'S	03	Mr. VIREN CHANDANSHIVE, Mr. ARBAZ KAZI	ONE WEEK
02	NITTT TEACHER TRAINING MODULES	02	Ms. PUJA KADAM	2 MONTHS
03	ONE WEEK STTP'S	03	Mr. ARBAZ KAZI, Mr. VIREN CHANDANSHIVE, Mrs. ANU MURALI, Mr. VIKRANT KOTHARI	ONE WEEK
04	AICTE –NPTEL COURSES	03	Mr. VIKRANT KOTHARI, Mr. JAYDEEP CHOUGALE, Ms. PUJA KADAM	12-WEEKS

Importance of ETABs Software in Civil Engineering

ETABS plays a significant role in civil engineering due to its importance in the design, analysis, and evaluation of building structures. Here are some reasons why ETABS is important in civil engineering:

- **Structural Analysis**: ETABS allows civil engineers to perform advanced structural analysis of building systems. It can simulate the behavior of structures under different loading conditions and accurately predict their response to forces such as gravity, wind, and earthquakes. This helps in ensuring the structural integrity and safety of buildings.
- **Efficient Design**: ETABS provides powerful design capabilities that enable engineers to optimize the design of structural components. It automates the process of generating design loads, performing code-based design checks, and producing detailed design reports. This helps in producing efficient and cost-effective structural designs.
- **Building Performance Assessment**: ETABS assists engineers in evaluating the performance of buildings under various conditions. It can assess factors such as structural stability, lateral stiffness, and deflection limits. This information is crucial for ensuring that buildings meet the required performance criteria and comply with building codes and regulations.
- **Seismic Analysis**: Earthquakes pose a significant risk to buildings in seismically active regions. ETABS offers specialized tools for seismic analysis and design. It can calculate seismic forces, determine the response of structures to earthquakes, and design structural elements to resist seismic loads. This helps in designing buildings that can withstand seismic events and protect human life.
- **Interdisciplinary Collaboration**: ETABS facilitates collaboration between civil engineers, architects, and other professionals involved in building design and construction. It supports the exchange of models and data with other software packages commonly used in the industry. This seamless interoperability allows for efficient communication, coordination, and integration of design decisions.
- **Time and Cost Savings**: ETABS automates several tasks involved in structural analysis and design. This helps in reducing manual effort, minimizing errors, and saving time during the design process. The software also enables engineers to quickly evaluate design alternatives and assess their impact on the structural performance. This iterative design process can lead to cost savings by optimizing the use of materials and reducing construction time and decision-making.



-Ms. Puja Kadam
(Asst. Prof., Civil Engg Dept.)

Diagrid Structures

Diagrid structures are architectural and structural systems that use diagonally arranged members to form a grid-like pattern. These structures derive their name from the combination of "diagonal" and "grid." Diagrid systems have gained popularity in modern construction due to their unique aesthetic appeal, structural efficiency, and sustainability. Here are some key points about diagrid structures:

- **Structural Efficiency**: Diagrid structures offer excellent structural efficiency by efficiently distributing loads across the building. The diagonal members act as bracing elements, transmitting forces to multiple points of support. This structural arrangement reduces the need for vertical columns and allows for open floor plans, maximizing usable space.
- **Stiffness and Stability:** The diagonal members in diagrid structures provide inherent stiffness and stability to the building. They resist lateral loads, such as wind and seismic forces, effectively. The triangulated pattern formed by the diagonals offers high rigidity, minimizing deflections and reducing the need for additional bracing elements.
- **Aesthetic Appeal**: Diagrid structures are visually striking and often serve as architectural landmarks. The unique diagonal patterns create an iconic and eye-catching appearance. The exposed diagrid framework can be seen on the exterior of the building, creating an attractive and distinctive architectural expression.
- **Material Efficiency**: Diagrid structures optimize the use of construction materials. The diagonal members efficiently transfer loads, reducing the need for excessive materials compared to conventional vertical column and beam systems. This results in material savings, reduced construction costs, and a more sustainable approach to building design.
- **Natural Ventilation and Daylighting**: The open framework of diagrid structures provides opportunities for natural ventilation and daylighting. The voids created by the diagonal members allow for improved airflow and natural light penetration into the building. This enhances occupant comfort, reduces the reliance on mechanical systems, and contributes to energy efficiency.
- **Sustainability**: Diagrid structures align with sustainable design principles. Their efficient use of materials reduces the carbon footprint associated with construction. The incorporation of natural ventilation and daylighting reduces energy consumption. Additionally, the durability and long-span capabilities of diagrid structures contribute to the longevity and adaptability of buildings.

–Mr. Arbaz Kazi
(Asst. Prof., Civil Engg Dept)

Confinement of Concrete Columns

- Confinement of concrete columns refers to the practice of providing additional reinforcement or confinement elements around the perimeter of a concrete column to enhance its strength, ductility, and resistance to various loading conditions, such as axial compression, bending, and seismic forces. This technique is particularly important in regions with high seismic activity. Here are some key points about the confinement of concrete columns:
- Purpose: The primary purpose of confining concrete columns is to improve their performance under extreme loading conditions. Confined columns are better able to withstand higher axial loads, exhibit increased ductility, and provide enhanced resistance to lateral forces and seismic actions.
- Confinement Methods: There are several methods used to confine concrete columns, including the use of steel hoops, spirals, or fiber-reinforced polymers (FRPs) wrapped around the column's perimeter. These confinement elements restrain the lateral expansion of the concrete core, effectively increasing its strength and ductility.
- Steel Hoops or Spirals: Steel hoops or spirals are commonly used for the confinement of concrete columns. These reinforcement elements are placed at regular intervals along the height of the column, providing lateral support to the concrete core. The confinement reinforcement should have sufficient spacing and proper detailing to ensure effective confinement.
- Fiber-Reinforced Polymers (FRPs): Fiber-reinforced polymers, such as carbon or glass fibers, can also be used for column confinement. FRP sheets or wraps are applied around the column's perimeter, improving its strength and ductility. FRP confinement offers the advantage of being lightweight, corrosion-resistant, and easier to handle and install.
- Benefits of Confinement: Confining concrete columns offers several benefits. It increases the compressive strength of the concrete, enhances its ductility and energy dissipation capacity, reduces the risk of premature failure, and improves the column's resistance to spalling and buckling under extreme loading conditions. Confinement also helps control the formation and propagation of concrete cracks.
- Seismic Resistance: Confinement is particularly crucial for concrete columns in seismic regions. During an earthquake, columns experience significant lateral forces and cyclic loading. Confined columns exhibit improved performance by reducing concrete spalling, enhancing ductility, and preventing premature failure, thus contributing to the overall seismic resilience of a structure.

-Mr. Vikrant Kothari
(Asst. Prof., Civil Engg Dept)