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Activity Report

Civil B.Tech Project Presentations – Academic Year 2025–26

1. Introduction

The B.Tech Project Presentations for Semester VI were successfully conducted on 15th December 2025 at Room 114, Sardar Patel College of Engineering, Mumbai. The activity was organised as part of the academic evaluation process to assess students' technical competence, research aptitude, presentation skills, and practical application of civil engineering concepts.

The presentations were evaluated by a panel comprising four external evaluators along with internal faculty members. Each group was allotted 15 minutes for presentation followed by 5 minutes for question and answer interaction.

2. Objectives of the Activity

The main objectives of conducting the B.Tech project presentations were:

- To evaluate students' understanding of their project work.
- To assess analytical, design, and problem-solving abilities.
- To encourage research-oriented and sustainable engineering solutions.
- To improve technical communication and professional presentation skills.
- To identify and recognise outstanding projects through the Best Thesis Award.

3. Schedule and Participation

A total of 14 project groups presented their work throughout the day as per the scheduled time slots from 9:30 am to 4:10 pm. The projects covered diverse areas such as sustainable construction materials, transportation planning using GIS, project monitoring and control, environmental engineering applications, safety practices, groundwater studies, and advanced concrete technologies

4. Evaluation Process

The evaluation was carried out based on:

- Problem identification and objectives
- Literature review and methodology
- Experimental / analytical work
- Results and interpretation
- Innovation and sustainability aspects

- Presentation clarity and confidence
- Responses during Q&A session

The external evaluators provided valuable feedback to each group, highlighting strengths and suggesting improvements for future research and professional practice.

5. Best Thesis Project

After detailed evaluation, the project titled:

"Utilization of Waste Red Bricks as Construction Materials"

was adjudged as the Best Thesis Project for the academic year 2025–26.

Summary of the Best Thesis Project

The project aimed at developing sustainable, cost-effective, and environmentally responsible bricks using waste red bricks and PET plastic waste. Waste bricks were crushed into fine aggregates and combined with PPC cement and shredded PET plastic (0.5%–2%) to enhance mechanical performance. Interlocking and hollow brick moulds were specially designed to reduce mortar consumption and improve construction efficiency.

The bricks were tested for compressive strength, water absorption, density, durability, and thermal conductivity as per Indian Standards. Results showed:

- Compressive strength improved with PET content, with 1.5% and 2% PET mixes meeting first-class brick requirements.
- Reduced density due to hollow configuration and PET inclusion, resulting in lighter bricks.
- Improved thermal insulation performance.
- Cost competitiveness compared to conventional burnt clay bricks.

The project successfully demonstrated that waste red brick-based composite interlocking bricks are suitable for sustainable and affordable construction, particularly in non-load-bearing and selected load-bearing applications

6. Outcomes of the Activity

- Students gained confidence in presenting technical work to external experts.
- Exposure to real-time professional evaluation enhanced learning.
- The importance of sustainability and innovation in civil engineering was strongly reinforced.

- The Best Thesis recognition motivated students towards research excellence.
- Faculty members received constructive academic feedback for curriculum and project guidance improvement.

7. Conclusion

The B.Tech Project Presentation activity was conducted successfully with disciplined adherence to schedule and academic standards. The event provided an excellent platform for students to showcase their technical competence, creativity, and commitment to sustainable engineering practices. The recognition of the Best Thesis Project further encouraged quality research and innovation among students.

Overall, the activity significantly contributed to the academic, professional, and personal development of the B.Tech students.

The project “Utilization of Waste Red Bricks as Construction Materials” was carried out to develop a sustainable, cost effective, and environmentally responsible alternative to conventional kiln burnt bricks by recycling waste red bricks and incorporating plastic waste. The study addressed critical issues related to construction and demolition waste, excessive topsoil consumption, high energy usage, and CO_2 emissions associated with traditional brick manufacturing.

Waste red bricks were collected from demolition sites, crushed, and processed into fine aggregates. PPC cement was used as the binding material, and shredded PET plastic was incorporated in proportions ranging from 0.5% to 2% by weight of cement to improve mechanical performance. Trial mix designs were conducted to determine the optimum cement content, followed by development of plastic infused composite mixes, following which custom interlocking and hollow moulds were designed and fabricated to enhance construction efficiency and reduce mortar consumption.

The developed bricks were evaluated through compressive strength, water absorption, density, drop test, visual inspection, and thermal conductivity testing in accordance with relevant Indian Standards. The compressive strength results demonstrated a consistent increase with higher PET content, with 1.5% and 2% PET mixes exceeding the IS requirements for first-class bricks. Water absorption values were observed to be higher than those of conventional bricks due to the porous nature of crushed red brick aggregates and the increased exposed surface area resulting from the hollow geometry. Although PET addition reduced moisture ingress to a certain extent.

A significant reduction in density was observed due to the combined effect of lightweight PET inclusion and the hollow interlocking brick configuration. This reduction resulted in lighter masonry units, contributing to lower dead load, improved handling, and better thermal insulation performance, as confirmed by thermal conductivity testing.

Cost analysis revealed that the composite interlocking bricks are cost competitive with conventional burnt clay bricks, while offering added benefits such as reduced energy consumption, elimination of kiln firing, faster construction, and lower environmental impact.

Overall, the study successfully demonstrated that waste red brick based hollow interlocking composite bricks provided a structurally adequate, cost effective , and sustainable alternative to conventional bricks, particularly for non-load-bearing and selected load bearing applications in affordable and sustainable construction.