Report on Learning Commons for collaborative learning in small groups

on

" Compressive strength differentiation through NDT and UTM for M25 mix concrete "

Date – 06/04/2024

Resource: Lab No. 37 and 38 Material Testing and Transportation Laboratory

On April 6, 2024, a comparative study was conducted to evaluate the compressive strength of M25 grade concrete using Non-Destructive Testing (NDT) and Universal Testing Machine (UTM) methods. This analysis aimed to understand the correlation between these techniques for reliable strength assessment.

Non-Destructive Testing involves methods like the rebound hammer and ultrasonic pulse velocity to estimate concrete strength without damaging the specimen. NDT offers quick, on-site evaluations but provides indirect strength estimates influenced by surface conditions, aggregate properties, and moisture content. It is ideal for quality checks and assessing existing structures.

Universal Testing Machine, on the other hand, is a destructive testing method that provides precise compressive strength measurements by crushing standard concrete specimens (cubes or cylinders). UTM is the benchmark for evaluating concrete strength, adhering to IS 516 standards for accuracy.

The study revealed that UTM results were more consistent and accurate for determining true compressive strength. NDT provided slightly varied results due to surface inconsistencies but was valuable for preliminary assessments.

Combining both methods allows for comprehensive evaluation: NDT for rapid inspections and UTM for detailed validation. This dual approach ensures effective quality control in construction projects involving M25 concrete.

Societal Impact of Mixing Waste Plastic in Concrete

- **Enhanced Safety**: Accurate strength assessment ensures the reliability of concrete structures, preventing potential collapses and safeguarding lives.
- **Improved Infrastructure Longevity**: Combining NDT and UTM methods ensures durable construction, reducing the frequency of repairs and disruptions.
- **Cost-Efficient Maintenance**: Early detection of strength issues through NDT minimizes the need for extensive, costly repairs or replacements.
- **Resource Optimization**: UTM's precise testing helps optimize material usage by validating mix designs, reducing wastage in construction.
- **Sustainability in Construction**: Reliable testing methods ensure that concrete meets strength standards, contributing to sustainable and resilient infrastructure.
- **Public Confidence**: Consistent quality control in construction projects instills trust among communities in the safety and durability of public and private structures.

Sign Sheet as they have utilised material testing laboratory

S. No.	Name of Student/Faculty	Section	Sign/Remarks
1	Wrushabh Dholariya	Gx	
2	Parth Sidpara	Gx	
3	Harsh Vegad	Gx	
3	Pranav Sidpara	Gx	
4	Dr. Hemantkumar G. Sokusare		Result Checking
5	Mayank P. Parekh		Cube Checking
6	Ashraf Mathkiya		Lab Incharge

Head of Department
Department of Civil Engineering
Faculty of Engineering & Technology
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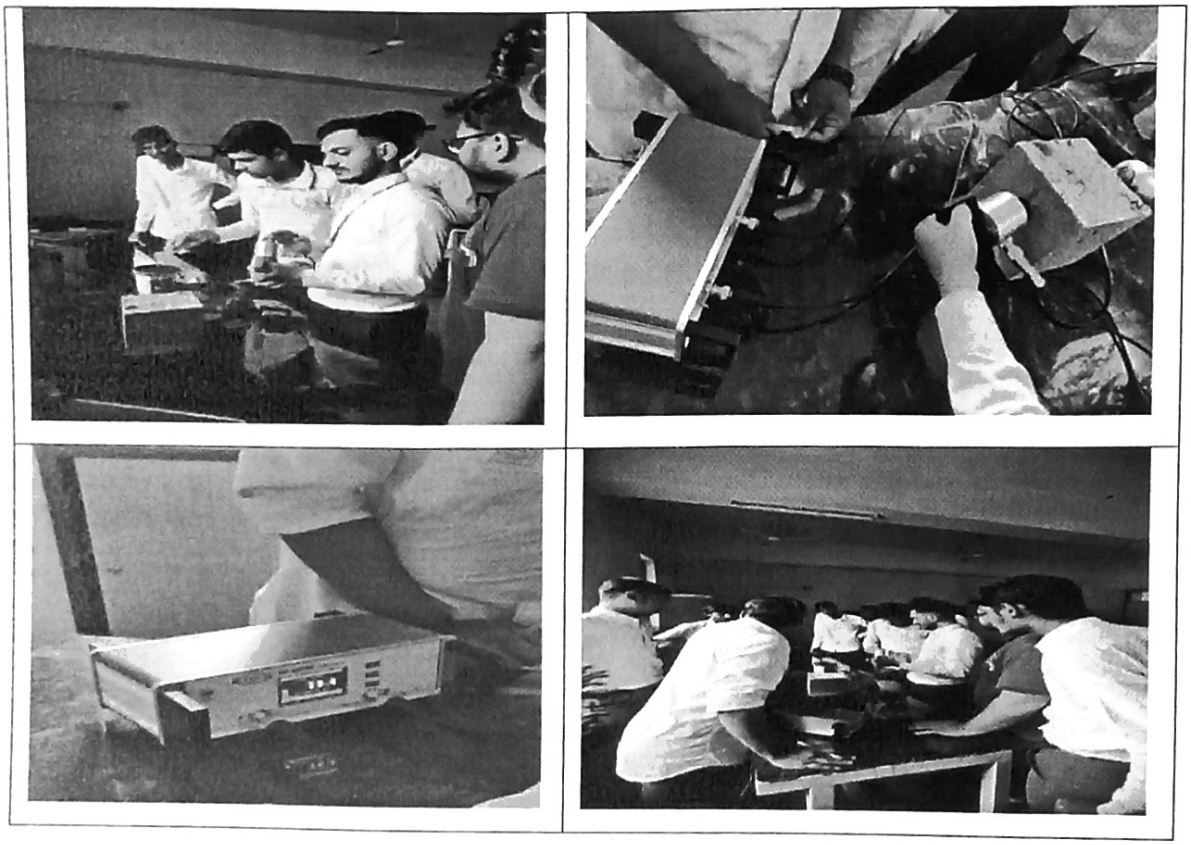
Photos



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Report :- 2022-23

Report on Learning Commons for collaborative learning in small groups

on

"Rubber Mix With Concrete to Explore the Durability for Porous Roads"

Date – 10/02/2023

Resource: Lab No. 37 Material Testing Laboratory

Atmiya University Rajkot

On February 10, 2023, an innovative experiment explored the potential of mixing rubber strips with concrete to enhance the durability of porous roads. Porous roads, designed to allow water to seep through, mitigate urban flooding and improve water management. However, their longevity is often compromised due to wear and tear, making durability a critical focus area.

Rubber strips, primarily sourced from recycled tires, were integrated into concrete mixtures to test their impact on flexibility and durability. The elastic nature of rubber enhances the concrete's capacity to withstand stress and reduce cracking. Moreover, the addition of rubber may improve resistance to freeze-thaw cycles, a common issue in porous road structures.

This experimental approach also promotes environmental sustainability by recycling waste rubber, reducing landfill accumulation. Preliminary results indicated that rubber-modified concrete exhibited better shock absorption and strength retention compared to traditional porous concrete.

This research opens pathways for developing eco-friendly, durable road materials suited for urban and rural applications. The integration of recycled materials like rubber into infrastructure not only addresses environmental concerns but also enhances the performance and lifespan of critical public assets. Future studies will refine the mix ratios and evaluate long-term performance under varying climatic conditions.

Societal Impact of Mixing Rubber Strips with Concrete for Porous Roads:

1. **Flood Mitigation**: Porous roads with enhanced durability improve water drainage, reducing urban flooding risks.
2. **Sustainable Waste Management**: Recycling waste rubber reduces landfill accumulation and promotes eco-friendly practices.
3. **Longevity of Infrastructure**: Improved durability minimizes road maintenance costs and disruptions, enhancing public convenience.
4. **Economic Benefits**: Lower maintenance expenses save taxpayer money and optimize infrastructure budgets.
5. **Environmental Conservation**: Using recycled rubber decreases the demand for natural resources and lowers carbon footprints.
6. **Safety Enhancement**: Rubber-modified concrete absorbs shocks better, reducing the risk of road cracks and accidents.
7. **Urban Aesthetic Improvement**: Well-maintained porous roads prevent waterlogging and maintain cleaner cityscapes.
8. **Resilience to Climate Change**: Enhanced materials withstand extreme weather, ensuring functional roads year-round.
9. **Job Creation**: The process of recycling rubber and constructing durable roads generates employment opportunities.
10. **Community Well-being**: Reliable road networks improve transportation, access to resources, and overall quality of life.

Sign Sheet as they have utilise material testing laboratory

S. No.	Name of Student/Faculty	Section	Sign/Remarks
1	Chasiya Rana	Gx	Rana C.
2	Ankit Rathod	Gx	Ankit Rathod
3	Hiren Parghi	Gx	Hiren
4	Mr. Hiren Ramani		Guiding on concrete
5	Dr. Hemantkumar Sonkusare		Result Checking

Head of Department
Department of Civil Engineering
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Rajkot

Photos

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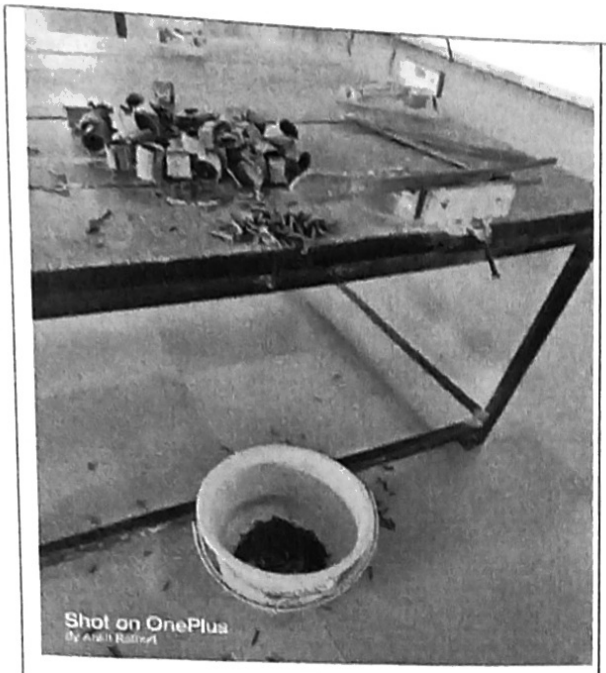

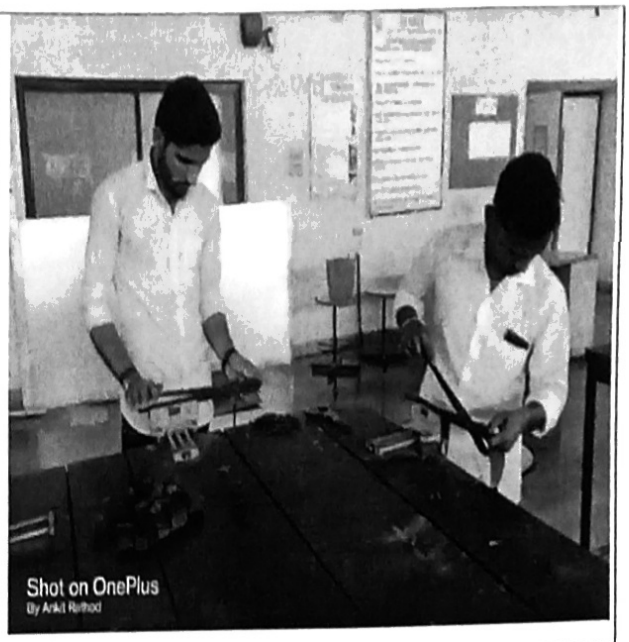

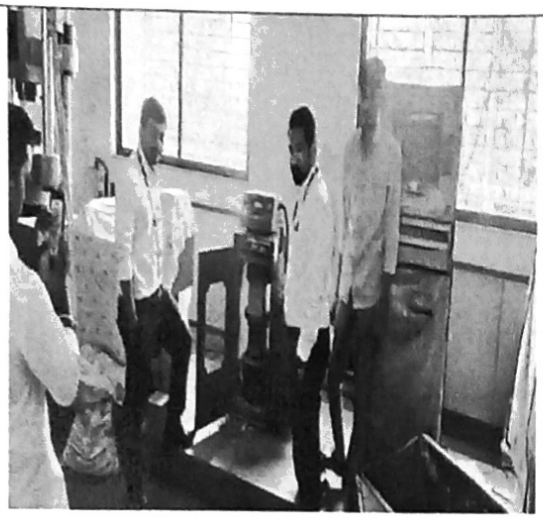

COLLABORATIVE LEARNING

Collaborative Learning

B.TECH. 8TH SEM. MECHANICAL ENGINEERING

Date – 10/03/2022

Organised by

DEPARTMENT OF MECHANICAL ENGINEERING

Department of Mechanical engineering has arranged collaborative learning in small groups for Major project. Dr. Ghanshyam Acharya and Mr. Manokumar sheladiya has guided students for Major project.

OBJECTIVES:

- To develop communication skill
- To project innovative ideas
- To execute design thinking process through different canvases by brainstorm exercise

COLLABORATIVE LEARNING

List of Participants

Roll No	Enr No	Student Name
1	180005001	Bhimani Jay Rohitbhai
3	180005003	Dhamasaniya Dhruvin Prabhulal
4	180005004	Domadiya Dhruvik Hemantbhai
5	180005006	Fachara Dhruv Jagadishbhai

Glimpse of Activity

Atmiya University Rajkot

COLLABORATIVE LEARNING

SUMMARY REPORT

Collaborative Learning Activity

"MINOR PROJECT - II"

B.TECH. 6TH SEM. MECHANICAL ENGINEERING

Date – 10/03/2022

Organised by

DEPARTMENT OF MECHANICAL ENGINEERING

Department of Mechanical engineering has arranged collaborative learning in small groups for Minor project. Mr. Sagarkumar shah has guided the students for Minor project.

OBJECTIVES:

- To develop communication skill
- To project innovative ideas
- To execute design thinking process through different canvases by brainstorm exercise

COLLABORATIVE LEARNING

List of Participants

PARTICIPANTS		
Roll No	**Enr. No.**	**Student's Name**
1	190005003	Gosai Kunal Bipin
2	190005004	Jadav Abhay Pravinbhai
3	190005007	Parmar Vishvajeet Pravinbhai
4	190005008	Rathod Meet Gunwantbhai
5	190005009	Sardhara Abhishek Dipakbhai
6	191005030	Singhadia Jaykishan Arjan
7	201005001	Faldu Fenil Sureshbhai

Glimpse of Poster Presentation

Atmiya University Rajkot

COLLABORATIVE LEARNING

Collaborative Learning

B.TECH. 1st SEM. ENGINEERING STUDENTS

Date – 26/12/2022

Organised by

DEPARTMENT OF MECHANICAL ENGINEERING

Department of Mechanical engineering has arranged collaborative learning in small groups for Orthographic Projection topic of Engineering Graphics and Computer drawing course for 1st semester students. Mr. Jinesh Shah and Mr. Sagarkumar Shah have provided detailed guidance for orthographic projection through model.

Objective of Activity:

- **To develop visualization ability.**
- **To provide more clarity about different views.**

Atmiya University Rajkot

COLLABORATIVE LEARNING

List of Participants

Roll No	Enr No	Student Name
1	220002003	Ajiya Nitin Narendrabhai
2	220002004	Akbari MAnav Hitesh
3	220002005	Ambasana Harsh Vijaybhai
4	220002006	Amreliya Jenish Manshukhbhai
5	220002009	Bavaliya Parth Vijaybhai

Glimpse of Activity

Atmiya University Rajkot

COLLABORATIVE LEARNING

Collaborative Learning

B.TECH. 6TH SEM. MECHANICAL ENGINEERING

Date – 01/01/2022

Organised by

DEPARTMENT OF MECHANICAL ENGINEERING

Department of Mechanical engineering has arranged collaborative learning in small groups for Solid works. Mr. Shivang Jani has guided students for modelling creation through software.

OBJECTIVES:

- To understand need of modelling in current era
- To create modelling as per industry need.

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COLLABORATIVE LEARNING

List of Participants

Sr. No	Enr No	Student Name
1	190005004	Jadav Abhay Pravinbhai
2	190005007	Parmar Vishvajeet Pravinbhai
3	190005008	Rathod Meet Gunwantbhai
4	190005009	Sardhara Abhishek Dipakbhai

Glimpse of Activity

Atmiya University Rajkot

Report :- 2021-2022

Report on Learning Commons for collaborative learning in small groups

on

" Waste plastic mix in concrete to achieve sustainable solutions for greener tomorrow"

Date – 05/01/2022

Resource: Lab No. 37 and 38 Material Testing and Transportation Laboratory

Atmiya University Rajkot

On January 5, 2022, a collaborative learning initiative explored the use of waste plastic in concrete to promote sustainable solutions for a greener future. This innovative approach aligns with the global push toward circular economy principles and environmental preservation. By incorporating recycled plastic into concrete, researchers and industry professionals aimed to address two critical challenges: reducing plastic waste and enhancing concrete properties.

The collaboration involved engineers, environmentalists, and policymakers, fostering an exchange of ideas to develop eco-friendly construction materials. Waste plastic, such as polyethylene terephthalate (PET), was shredded and mixed with concrete to replace a portion of conventional aggregates. This integration not only reduced the environmental burden of plastic waste but also improved concrete's durability and resistance to cracking.

Hands-on workshops and case studies highlighted the practical applications of plastic-modified concrete in building sustainable infrastructure. Participants discussed the environmental benefits, such as reduced carbon emissions and conservation of natural resources, alongside economic advantages like cost reduction in material production.

This collaborative learning initiative demonstrated the power of teamwork in addressing global challenges. By turning waste into value-added materials, the project set a benchmark for sustainable construction practices, inspiring industries and academic institutions to pursue innovative green solutions.

Societal Impact of Mixing Waste Plastic in Concrete

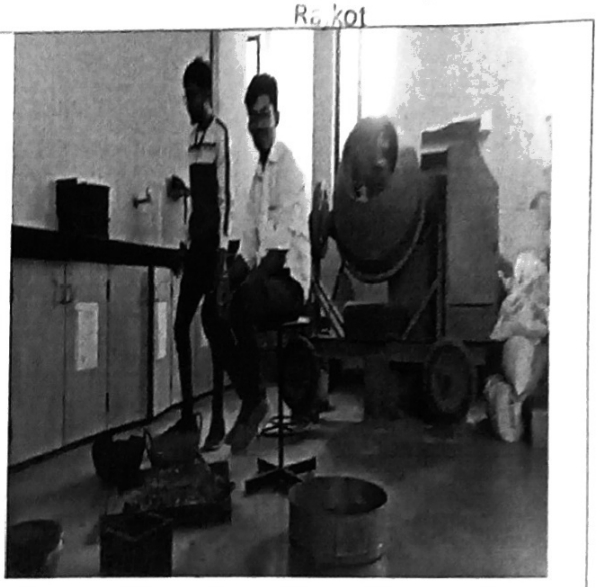
1. **Environmental Protection**: Recycling waste plastic in concrete reduces plastic pollution, minimizes landfill use, and prevents harmful plastic waste from contaminating ecosystems.
2. **Sustainable Construction**: Utilizing waste plastic in concrete promotes eco-friendly construction practices, conserving natural resources and reducing the reliance on traditional, non-renewable aggregates.
3. **Climate Change Mitigation**: By reusing plastic, carbon emissions from the production of virgin materials are reduced, contributing to a greener future.
4. **Cost-Effective Infrastructure**: Incorporating waste plastic can lower material costs in construction, making infrastructure projects more economically viable for communities.
5. **Enhanced Durability and Safety**: Plastic-modified concrete improves resistance to cracking and wear, leading to longer-lasting structures and safer roadways.
6. **Community Awareness and Engagement**: Promoting the use of recycled plastic in concrete raises awareness about the importance of sustainability and encourages community participation in recycling programs.

Sign Sheet as they have utilise material testing laboratory

S. No.	Name of Student/Faculty	Section	Sign/Remarks
1	Chetan Chavda	Gx	
2	Prakash Bathwar	Gx	
3	Shaktisinh Jadeja	Gx	
4	Ashraf Mathkiya		Lab Incharge
5	Mayursinh B. Jadeja		Cube Checking

Head of Department
Department of Civil Engineering
Faculty of Engineering & Technology
Atmiya University
Rajkot

Photos



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