Volume: I

2022–2023

D Y PATIL GROUP

TERRA NIRMAN

Building Foundations, Shaping Futures

Atmanirbhar Bharat: Indigenous Innovations in Construction

Department of Civil Engineering

Vision:

To impart quality education in civil engineering.

Mission:

M1: To provide an experiential teaching-learning environment and promote research culture.
M2: To establish a center of excellence by providing training of modern tools and emerging technologies.
M3: To in still social and ethical values among the students.

Program specific objectives (PSOs):

Our students will be able to-
PSO1: Design and develop civil engineering structures with software proficiency.
PSO2: Address & give engineering solutions for environmental challenges & sustainable development.
PSO3: Execute civil engineering projects as a skilled professionals utilizing enhanced Management techniques.

Program Educational Objectives: (PEOs):

Our graduates will be able to-
PEO1: Apply integrated knowledge and skills to solve complex civil engineering problems.
PEO2: Pursue entrepreneurship and innovation in civil engineering while upholding professional integrity, social responsibility, and ethical values.
PEO3: Excel in professional careers exhibiting leadership qualities.

Editorial Team

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Dr. Aakanksha Ingle

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(B.E)

Editorial Team Member:
Harshal Korde (TE)

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TERRA NIRMAN
Building Foundations, Shaping Futures

The Department of Civil Engineering proudly presents the inaugural edition of its annual magazine, Terra Nirman — a platform that reflects our department's unwavering commitment to sustainability, innovation, and academic excellence. Rooted in the idea of "solid ground," Terra Nirman symbolizes the strong foundations on which we build not only structures, but also ideas, values, and futures. With The tagline "Building Shaping Futures," this encapsulates our collective Foundations, magazine journey toward responsible engineering and sustainable development.

This first volume offers an engaging glimpse into the vibrant life of our department — from academic milestones and student achievements to research innovations and community-driven initiatives. highlights the creative spirit and technical prowess of our students and faculty through articles, technical reports, poems, illustrations, and reflections.

The magazine also documents our various activities throughout the academic year, including workshops, expert sessions, site visits, competitions, and social outreach programs. Each section of this edition demonstrates how our department continues to grow while staying grounded in its commitment to sustainability, knowledge-sharing, and industry relevance.

As you explore Terra Nirman, we invite you to walk through the efforts, aspirations, and accomplishments of our civil engineering community — a community that is not just constructing the world around us, but also shaping a more resilient and responsible tomorrow.

Welcome to Terra Nirman — where learning takes root and legacies are built.

REIMAGINING GROWTH

MESSAGE FROM OUR DIRECTOR

India is undergoing a remarkable transformation — one built not only on steel and concrete but also on vision, innovation, and purpose. In this spirit of transformation, I extend my heartfelt congratulations to the Department of Civil Engineering for conceptualizing Terra Nirman, a vibrant reflection of this New India in Construction. This edition signifies how civil engineering education is embracing futuristic thinking, sustainable technologies, and bold experimentation to shape tomorrow's India. Our youth are not just learners — they are builders of a nation that is inclusive, intelligent, and innovative.

ADYPSOE continues to foster such forward-looking platforms that empower students to think big, act responsibly, and engineer a future that resonates with the aspirations of Viksit Bharat.

Let this magazine stand as a symbol of what we can achieve when education, industry, and nation-building go hand in hand.
My best wishes to the editorial team for capturing this spirit so meaningfully.

Dr. Kamaljeet Kaur
Director Technical Campus, Ajeenkya DY. Patil Knowledge City

ENGINEERING FOR A TRANSFORMED TOMORROW: A VISION FROM OUR PRINCIPAL

In the landscape of a rapidly evolving nation, the role of engineers has become more vital than ever. Ajeenkya D Y Patil School of Engineering (ADYPSOE) stands at the forefront of this evolution, preparing students to be the architects of a New India

Our vision is to equip every learner with not only technical expertise but also with the ability to think independently, act responsibly, and innovate continuously. New India in Construction is not a distant dream — it is unfolding every day through the actions of our students and faculty. I congratulate the Department of Civil Engineering and the editorial team for this inspiring initiative and wish continued success in shaping India's engineering future.

I congratulate the Department of Civil Engineering and the editorial team for this inspiring initiative and wish continued success in shaping India's engineering future.

Dr. F B Sayyad
Principal ,Ajeenkya DY Patil School of Engineering

THE BLUEPRINT OF PROGRESS: THOUGHTS FROM THE HOD

We are in the midst of a construction revolution — where the focus is shifting from just creating infrastructure to building sustainable, adaptive, and smart environments.

Terra Nirman is a tribute to this changing face of civil engineering in a New India. This new era calls for engineers who can integrate AI, green technologies, and innovative materials while being mindful of social impact and resilience. Our students are learning to become such changemakers — pushing boundaries, solving problems, and contributing to a stronger, smarter nation.

The Department of Civil Engineering remains committed to nurturing such talent. This magazine is proof of our students' capability to ideate, lead, and contribute meaningfully to national growth. I commend every contributor for making this edition a compelling reflection of India's next chapter in construction.

Lt. Col. Sanjay Karodpati (Retd)
Headof Department,Civil Engineering
Ajeenkya DY Patil School of Engineering

FRAMING THE FUTURE: FROM THE EDITOR'S DESK

Construction today is not only about engineering marvels — it is about resilience, inclusion, and innovation. The theme New India in Construction is about pushing limits, embracing smart technologies, and respecting the environment in everything we build. This edition of Terra Nirman is a canvas where ideas of tomorrow are painted by the students of today. It reflects how construction can be adaptive, human-centric, and globally competitive — yet deeply rooted in Indian ethos. I hope the stories and projects showcased here inspire others to think creatively and construct meaningfully. Together, let us script a new chapter where engineering becomes a bridge to sustainable progress.

Dr. Aakanksha Ingle

Editor-in-Chief

ABOUT THE DEPARTMENT

An affectionate welcome to the Civil Engineering discipline.The Department of Civil Engineering strives for excellence in teaching and learning along with professional development. The department has state-of-art laboratories which are NABL accredited with 150 tests.

Ours is the first private engineering college in Maharashtra for getting NABL accreditation. The department with its experienced faculties offer practice based education with latest techniques thereby preparing our students for a successful and rewarding career .The department maintains its strong links with the construction industry by engaging in consultancy activities.

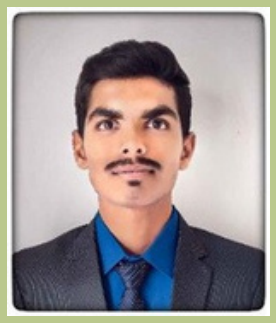
The students here are encouraged to engage extra-curricular and co-curricular activities which are essential for personality development, nurturing of team spirit and development of organizational skills. The field of Civil Engineering is very broad, covering many are as such as planning, design and construction of buildings, highways and bridges, irrigation schemes, water supply and sewerage schemes, powerhouses and transmission systems ,tunnels and underground structures, etc. It is our aim to provide you with the necessary education to face these challenges with confidence

Meet Our CESA Team

Mr. Shubham Kad
President

Mr. Abhishek Parab
Vice president

Mr. Rakesh Chavan
General Secretory



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Discipline In-charge

Mr. Mayank Thakur
DisciplineIn-charge

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Class Representative

Mr. Pranay Diyewar
Class Representative

Mr. Pawan Mokale
Class Representative

Mr. Aditya Rakh
CommitteeMember

Miss. Anuradha Sontakke
Committee Member

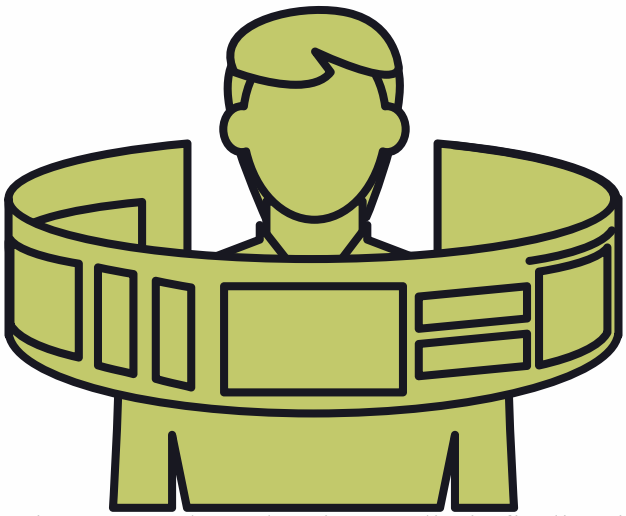
Mr. Yash Shirke
CommitteeMember

THEME ABOUT THE MAGAZINE

Atmanirbhar Bharat: Indigenous Innovations in Construction":

India is witnessing a transformative era in infrastructure and construction, driven by the vision of Atmanirbhar Bharat—self- As the nation aspires to reduce its dependence on foreign technologies and imports, the construction sector stands at the forefront of this change. Indigenous innovations in materials, techniques, and technologies are not only enhancing efficiency and sustainability but also creating jobs, empowering local communities, and fostering economic resilience. From eco-friendly building materials like fly ash bricks and bamboo composites to advanced modular construction methods developed by Indian startups and institutions, the momentum towards self-reliance is unmistakable. Initiatives like Make in India and PM Gati Shakti are further fueling this progress by encouraging research, development, and deployment of homegrown solutions. This edition of the magazine explores how India's construction landscape is evolving through indigenous ingenuity. We spotlight the architects, engineers, innovators, and policymakers who are shaping a future where India builds not just for itself, but by itself—sustainably, affordably, and proudly.

REINVENTING THE ROOTS – TRADITIONAL TECHNIQUES FOR MODERN INDIA



Introduction: In a world racing toward modernity, India is finding its strength by looking back. The spirit of Atmanirbhar Bharat isn't just about building new structures—it's about rediscovering our ancient wisdom and adapting it for today's needs. From lime mortars to mud architecture, India's traditional construction techniques are now making a proud comeback, blended with modern engineering principles.

For centuries, structures like the temples of Hampi or forts of Rajasthan have stood the test of time without the use of cement or steel. These marvels relied on locally available materials, climatic design, and sustainable load distribution techniques. Today, civil engineers are reintroducing methods like:

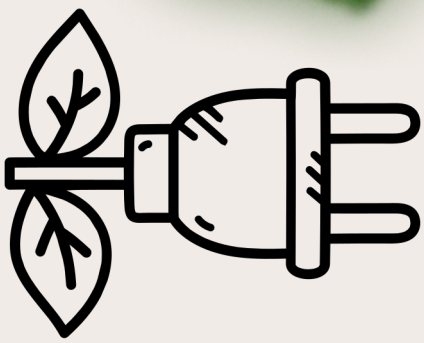
- Rammed earth walls, which offer high thermal insulation.
- Lime-stabilized soil foundations, reducing the carbon footprint of cement.
- Courtyard planning, which enhances natural ventilation.

Many startups are now using geopolymer technology and eco-blocks based on traditional Indian principles, helping reduce embodied energy while supporting local artisans.

Conclusion:

The future of Indian construction doesn't lie in copying foreign models butinadaptingour own time-tested wisdom withmoderntools. By merging traditionand technology,weare buildinga truly self-reliant Bharat—strong at its rootsand boldin itsvision.

BIO-BASED MATERIALS – THE GREEN REVOLUTION IN CONSTRUCTION



Whatif buildings could breathe,heal, and grow just like plants? As part of the Atmanirbhar Bharat mission, India is stepping into an exciting phase of biotechnology-infused construction. It's no longer science fiction—our engineers are turning agricultural waste into building material gold.

India, being an agricultural nation, produces vast amounts of biomass. Innovators are now converting:

Rice husk ash, bagasse, and coir pith into lightweight concrete.

Biochar, a byproduct of pyrolyzed biomass, as a partial cement replacement.

Hempcrete, a mix of hemp and lime, offering structural insulation and carbon sequestration.

These materials not only reduce the use of Portland cement, but also lower construction costs and enhance indoor air quality.

Laboratories and institutes like CSIR and IITs are working on fiber-reinforced composites using natural jute, bamboo, and kenaf—providing tensile strength while supporting indigenous farming communities.

From waste to wonder, India is leading a quiet green revolution in construction. Bio-based innovations are not just a trend—they are becoming the backbone of sustainable, local construction. This is Atmanirbhar Bharat—where our fields are not just feeding us, but sheltering us too.

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BUILDING WITH EARTH, NOT CONCRETE – THE MUD HOUSE REVIVAL

These methods drastically cut down the use of reinforced concrete, water, and energy. They're being used in government schools, eco-resorts, and rural housing programs under PMAY (Pradhan Mantri Awas Yojana). Architects like Laurie Baker and institutions like Auroville Earth Institute have shown that structural integrity, load-bearing capacity, and aesthetic value can all be achieved through earthen architecture.

As we turn back to the soil, we are not regressing—we are progressing with purpose. With each mud wall we raise, we are building a nation that is both rooted and resilient. In the journey of Atmanirbhar Bharat, the earth beneath our feet may be our greatest strength

~ By Prof.Shreedhar Patil

SMART CONSTRUCTION WITH INDIGENOUS TECH STARTUPS

Can an app lay bricks? Can a drone monitor structural cracks? In the tech-driven wave of Atmanirbhar Bharat, Indian startups are reshaping construction with homegrown innovations—making sites smarter, faster, and more efficient.
Young Indian engineers are merging civil engineering with digital intelligence. Some standout innovations include:

- AI-based project management platforms predicting delays.
- Drone mapping for surveying and BIM (Building Information Modeling) systems created by Indian developers.
- On-site quality control apps using real-time data analysis to detect faulty concrete batches.
- Mobile-based quantity estimators in regional languages, helping local contractors.

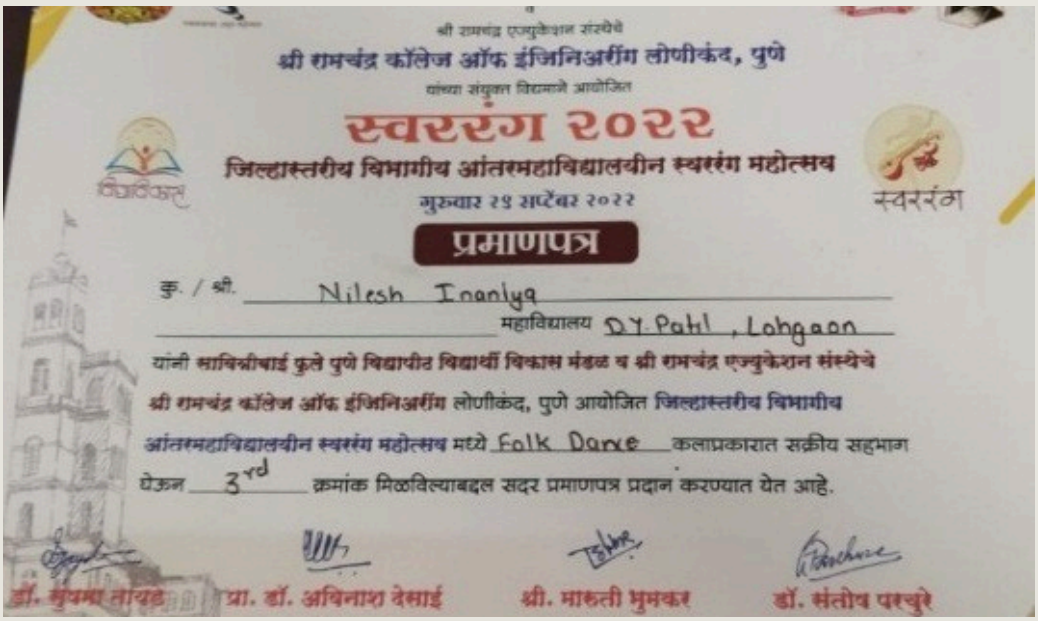
Startups are also focusing on low-cost sensor networks to monitor structural health, water seepage, and air quality in buildings. This is especially helpful in bridges, metro stations, and smart cities under AMRUT and PM GatiShakti schemes. With government grants under Startup India and Stand-up India, civil-tech ventures are scaling up rapidly—boosting both employment and innovation.

These aren't just tech tools—they are the new shovels and bricks of Indian construction. With every app, drone, and AI model developed in India, we're building a smarter, more resilient nation. Atmanirbhar Bharat is not only about self-reliance—it's about self-confidence.

~By Prof.Vishwajeet Kadlag

ACHIVEMENTS

We are proud tosharethat Nilesh Inaniya securedthe3rd Prize in the Folk Dance category at the Swarrang Competition 2022, heldat Shri Shree Ramchandra College of Engineering.



श्री रामचंद्र एज्युकेशन संस्थेचे

श्री रामचंद्र कॉलेज ऑफ इंजिनिअरींग लोणीकंद, पुणे

यांच्या संयुक्त विद्यमाने आयोजित

स्वररंग २०२२

जिल्हास्तरीय विभागीय आंतरमहाविद्यालयीन स्वररंग महोत्सव

गुरुवार २९ सप्टेंबर २०२२

स्वररंग

प्रमाणपत्र

कु. / श्री. Nilesh Inaniya

महाविद्यालय D.Y.Patil, Lohgaon

यांनी सावित्रीबाई फुले पुणे विद्यापीठ विद्यार्थी विकास मंडळ व श्री रामचंद्र एज्युकेशन संस्थेचे श्री रामचंद्र कॉलेज ऑफ इंजिनिअरींग लोणीकंद, पुणे आयोजित जिल्हास्तरीय विभागीय आंतरमहाविद्यालयीन स्वररंग महोत्सव मध्ये Folk Dance कलाप्रकारात सक्रीय सहभाग घेऊन 3rd क्रमांक मिळविल्याबद्दल सदर प्रमाणपत्र प्रदान करण्यात येत आहे.

डॉ. सुरेखा तांबडे | प्रा. डॉ. अविनाश देसाई | श्री. मारुती भुमकर | डॉ. संतोष पाचुरे

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ACHIVEMNTS

- Prof. Aakanksha Ingle completed PhD in Civil Engineering.
- Shri Satya Sai University of Technology and Medical Sciences, Bhopal, MP.

ACHIVMENTS

YouTube Channel of Civil Engineering Department is created. Which includes all technical lectures related to Civil Engineering.

HAPPENINGS IN THE DEPARTMENT:

Environmental Club have made and distributed 60 paper bags to faculties of all department

HAPPENINGS IN THE DEPARTMENT

NCC Activity by Prof. Aniket Nemade.

Cleanliness activity under Puneet Sagar Abhiyan at Indrayani River

Activity conducted at Indrayani River Bank (Charholi Khurd):

- **Collected the solid waste like plastic waste, glass bottles nearby river bank.**
- **Spread the awareness in the people about the importance of cleanliness nearby region by mouth publicity.**

HAPPENINGS IN THE DEPARTMENT:

Environmental Club successfully conducted an E-Waste Collection Drive on campus with active participation from 30 students.

Group discussion sessions for SSB preparation were conducted under the expert guidance of Lt. Col. Sanjay Karodpati (Retd.), with 21 cadets actively participating.

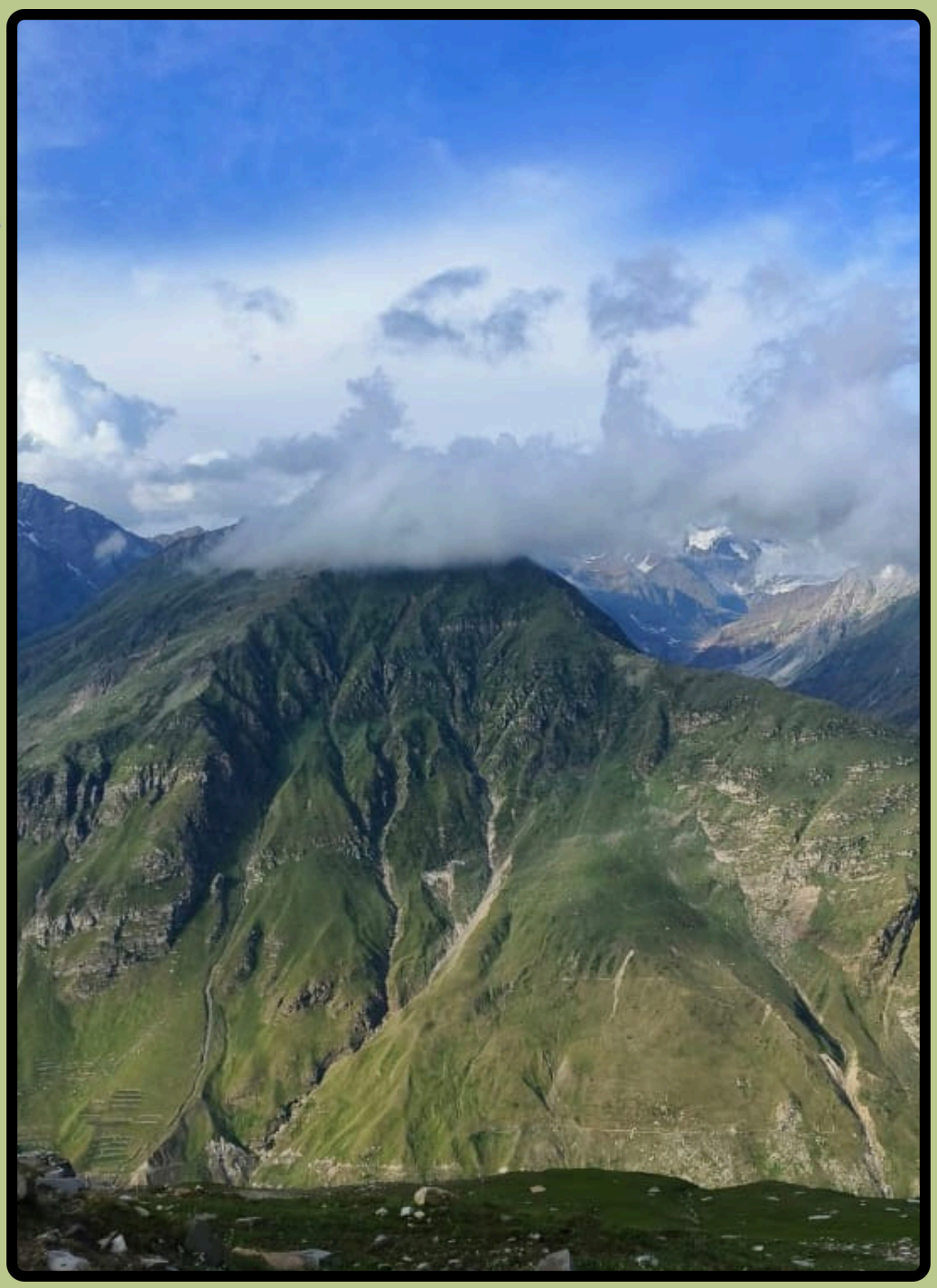
हम युवा, हमारी उड़ान" कदम-कदम बढ़ते ंचलो

"हम युवा, हमारी उड़ान" कदम-कदम बढ़ते चलो
कदम-कदम बढ़ते चलो, मं ज़ल पास बुलाती है, हर तूफ़ान को चीरकर, उम्मीद राह दखाती है।
ना डर राह के अंधेर से, ना रुकना ठोकर खाने पर, हर गरकर उठने वाला ही, इ तहास रचाता है घर-घर।
कलम से बनती तक़द र ह, सपन को पंख मलते ह, जो मेहनत को ईमान बना ल, वो ऊँचाइयाँ छूते ह।
जीवन है एक सं ाम नया, हर पल इसम लड़ना है, ले कन मुस्कान बाँट-बाँट कर, हर दल को भी पढ़ना है।
चलो चल उस दशा क ओर, जहाँ ान क रौशनी हो, हम युवा ह, हम बदलगे , जहाँ स ी मानवता हो।

~ताहेर सालुजी

-Captured By Korde Sayale S.E

Embrace the serene beauty of the mountains, where nature's grandeur unfolds.
A picturesque valley nestled amidst lush greenery and towering peaks."



-Captured By Mr. Rohan Saraf T.E

Misty clouds Kiss the lush green mountains, A serene escape into nature's silence.

Riddle

WHAT GOES ALL AROUND THE WORLD BUT STAYS IN A CORNER?

pmats A :rewsnA

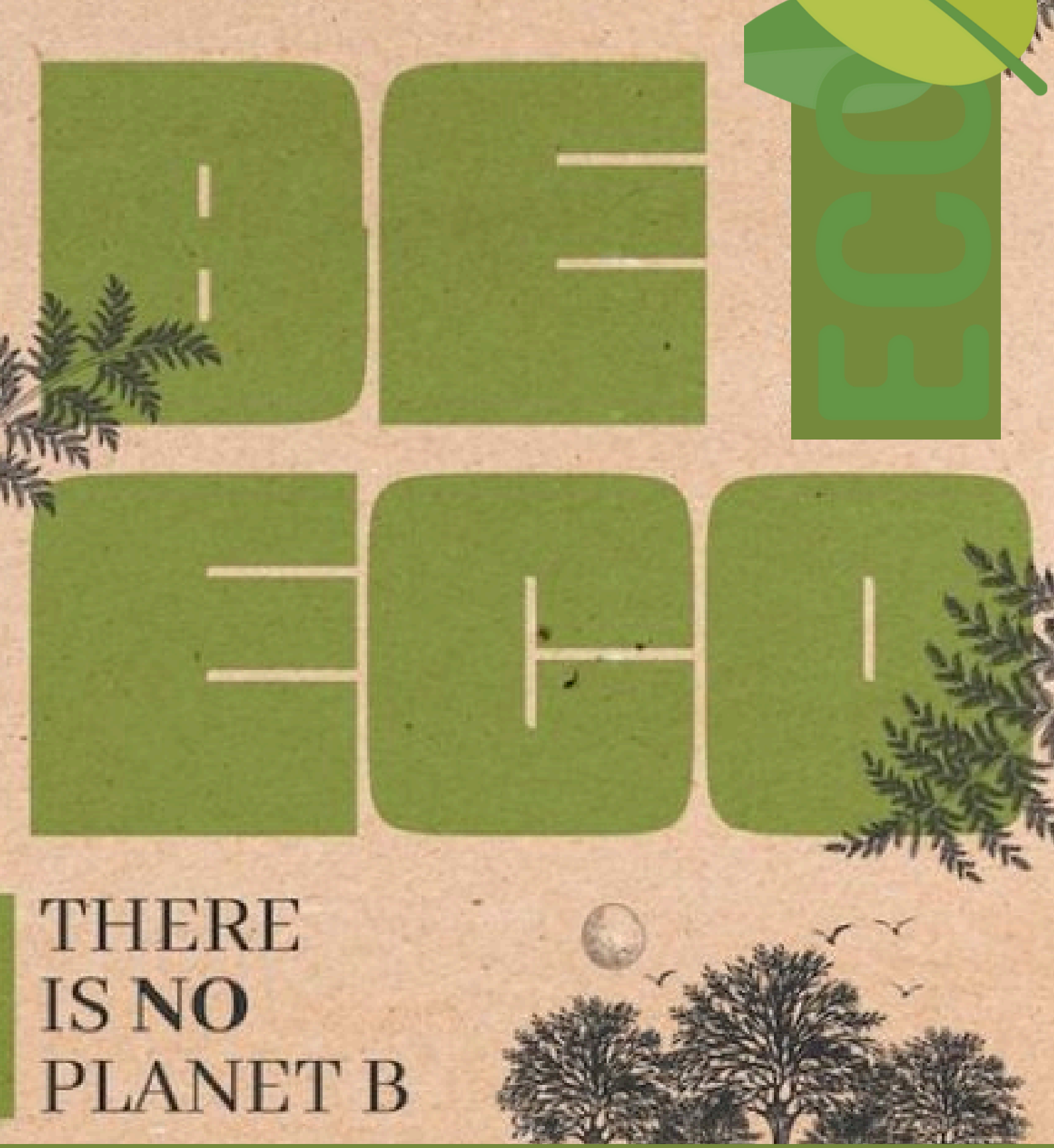
IT'S ALWAYS IN FRONT OF YOU BUT CANNOT BE SEEN. WHAT IS IT?

.erutuf ehT :rewsnA

Civil engineering

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

Inclinometer
structure
Molding
sector
model
hydraulics
Geometry
Tension
Survey
Phase
blueprint
Pressure
Optics
Torque
Newtonian
license
Pulley
Lever



STUDENT CHAPTERS