

Guest Lecture Report

The Science Behind Structural Failures: What Every Civil Engineer Must Know

A session on structural distress, diagnosis and remedial engineering for the Department of Civil Engineering

RESOURCE PERSON

Er. S. Soma Sekhar Naidu — Founder & Managing Director, D2D Engineers

DATE

21-07-2026

VENUE

College Seminar Hall, Department of Civil Engineering, MVGR College of Engineering (Autonomous), Vizianagaram

FORMAT

Lecture + Case Studies + Q&A

PARTICIPANTS

150+ II & III Year Civil Engineering students

ABOUT THE RESOURCE PERSON

Er. S. Soma Sekhar Naidu, M.E., AMIE, AIV (Chartered Engineer), is the Founder & Managing Director of Desire 2 Design (D2D) Engineers — a structural consultancy and turnkey construction firm offering services spanning structural design, NDT & soil testing, DGPS survey, seismic retrofitting and plan approvals. He returned to MVGR College of Engineering to share hard-won, site-tested lessons on why structures fail and how engineers diagnose, repair and prevent distress.

15+

Years Experience

36+

Projects Completed

50+

Skilled Team

₹250 Cr

Largest Project

OBJECTIVES OF THE SESSION

- Understand why well-designed, code-compliant structures still develop distress over time.
- **Recognise the spectrum of structural failure** — cracking, settlement, corrosion, spalling and seepage.
- Learn the systematic investigation procedure: visual inspection, crack mapping, site survey and testing.
- Build familiarity with Non-Destructive Testing (NDT) methods used to assess structures without damage.
- Understand remedial techniques and the modern technologies reshaping structural health monitoring.

TOPICS COVERED

- **Structural Failure as a Spectrum** — cracking, settlement, corrosion, spalling & seepage, and how each begins as a warning sign.
- **Life Cycle of a Structure** — planning, design, construction, service & maintenance, and how failure can originate at any stage.
- **Root Causes of Distress** — poor planning, inadequate soil investigation, improper construction, material quality issues, environmental effects and lack of maintenance.
- **Concrete & Reinforcement on Site** — water-cement ratio, compaction, curing, and how corrosion silently reduces load-carrying capacity.
- **Investigation Procedure & NDT** — visual inspection, crack mapping, Rebound Hammer, Ultrasonic Pulse Velocity, Half-Cell Potential and GPR testing.
- **Remedial Measures & Modern Technology** — crack injection, jacketing, corrosion control, BIM, IoT monitoring and sustainable construction practice.

INTERACTIVE LEARNING & DEMONSTRATION

Er. Naidu walked students through real site photographs of cracking, honeycombing and corroded reinforcement, explaining how pattern and location reveal root cause. He demonstrated the logic behind Rebound Hammer, UPV and Half-Cell Potential testing, and students actively engaged in the open Q&A that followed — connecting classroom theory to the diagnostic process used on live sites.



CAREER GUIDANCE FOR FUTURE ENGINEERS

- **Start on Site** — a graduate trainee role builds the practical discipline no classroom can teach.
- **Teach to Sharpen Skill** — explaining concepts to others deepens your own understanding.
- **Seek Large Exposure** — work on big, complex projects early to build real judgement.
- **Build Technical Credibility** — deep expertise earns trust and opens new opportunities.
- **Keep Learning Widely** — structural, soil, NDT and PMC skills together make you versatile.
- **Take the Entrepreneurial Leap** — when ready, starting your own practice is a natural next step.

GLIMPSES OF THE EVENT



Addressing the students



Discussion with MD, HOD and Faculty Members



Students following the session

OUTCOME & CONCLUSION

The session gave students a rare, diagnostic view of structural engineering — moving beyond design formulae to how real structures behave, fail and get repaired. Live site photographs, NDT procedures and root-cause case studies helped connect Strength of Materials and Structural Analysis fundamentals to the judgement required on an actual site, leaving students better equipped to recognise early warning signs in their future careers.

FELICITATION

Er. S. Soma Sekhar Naidu was felicitated with a book by the faculty and student coordinators, in recognition of his time, insight and continued support to the department.





Felicitation to HOD, Mr. Rajendra Prasad, from D2D Engineers MD, S. Soma Sekhar Naidu

GROUP PHOTO



Faculty, students, HOD and D2D Engineers MD, S. Soma Sekhar Naidu

"Great engineers are not only those who design structures, but those who understand how structures behave throughout their service life."

— Er. S. Soma Sekhar Naidu, Founder & Managing Director, D2D Engineers