

UDAY SHANKAR YADAV

CIVIL ENGINEER [NEC: 29679 Civil "A"]

Member, American Society of Civil Engineering
Member, Nepal Geotechnical Society

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A results-driven Civil Engineering professional with expertise in **sustainable construction materials** and **advanced concrete technology**. Specializes in low-carbon, high-performance cementitious composites, with extensive experience in testing and research. Committed to driving innovation in sustainable construction practices and contributing to eco-friendly engineering solutions.

PROFESSIONAL EXPERIENCE

ENGINEER, **GEO ENGINEERING PVT. LTD. HETAUDA**

[DEC 2023 – PRESENT]

- Designed **3×3 matrix composite sections** using **ISMB 600** beams for **510-ton static pile load tests** (14m span) and **500-ton pull-out pile load tests** (12m span), ensuring structural integrity and compliance with ASTM D1143/IS 800 standards.
- Conducted **geological mapping** of the Mahabharat Range (KTFT CP6), analyzing rock formations, fault zones, and stratigraphic profiles to guide slope stability and foundation design.
- Developed **concrete mix designs (M25-M40)** for Hetauda Sub-Metropolitan City infrastructure, optimizing cement ratios, slump tests, and compressive strength as per IS 456-2000 and IS 10262 guidelines.
- Performed **300+ Cross-Hole Sonic Logging (CSL) and Pile Integrity Tests (PIT)** for Kathmandu-Terai Expressway (KTFT) piles, identifying voids, cracks, and concrete homogeneity issues.
- Executed **welding integrity tests** (Ultrasonic + Dye Penetrant) for scaffolding in **KTFT CP4 & CP5**, adhering to ASTM E164/E1417 standards to ensure weld quality and safety compliance.
- Conducted **dynamic load tests** (ASTM D4945), and **lateral load tests** for bridge and tunnel piles, analyzing deflection, settlement, and load-bearing capacity.
- Performed **non-destructive testing** (Ultrasonic Pulse Velocity, Rebound Hammer) on 200+ concrete structures, correlating results with core sampling data for QA/QC validation.
- Prepared **technical reports** detailing test methodologies, compliance with DoR/Nepal standards, and recommendations for corrective actions in pile/beam designs.
- Utilized **AutoCAD Civil 3D** for as-built documentation and **ETABS** to validate beam matrix designs under 500+ ton loads.
- Collaborated with contractors and government agencies to streamline testing schedules, reducing project delays.

JUNIOR RESEARCH FELLOW (JRF), **INDIAN INSTITUTE OF TECHNOLOGY (IIT) PATNA** [JULY 2023 – NOV2023]

- Conducted **structural assessments** of 5 G+8 buildings using **Rebound Hammer tests** (IS 13311-Part 2) on 250+ structural members (columns, beams, slabs), identifying critical weaknesses such as **15% below-grade concrete strength and 20% delamination**, and recommending targeted repairs.
- Performed **liquefaction risk assessments** for earthquake magnitudes (M5.0–M7.5) using SPT-N data (ASTM D1586) and PLAXIS 2D simulations, proposing **stone column densification and raft foundations** to mitigate settlement risks by **40-60%** in high-risk zones.

- Designed **retrofitting solutions** (CFRP wrapping per ACI 440.2R, steel bracing per IS 800) for 10+ shear-critical beams and soft-story structures, enhancing lateral load capacity by **35%** and reducing seismic vulnerability to **<10%** (FEMA P-58).
- Developed **cost-effective rehabilitation plans** (epoxy injection, concrete jacketing) for 10+ cracked masonry walls and corroded columns, achieving **25% cost savings** and extending structural lifespan by **15-20 years** (IS 15988 compliance).

EDUCATION

Ph.D. GEOTECHNICAL ENGINEERING, UNIVERSITY OF MASSACHUSETTS LOWELL [AUG 2025 – PRESENT]

Department of Civil and Environmental Engineering

M.TECH CIVIL ENGINEERING, INDIAN INSTITUTE OF TECHNOLOGY PATNA (IITP) [JULY 2021 – JUNE 2023]

CPI = 8.84/ 10

Major Subjects – Advanced Structure Analysis, Advanced Foundation Engineering, Geotechnical Earthquake Engineering, Research Seminar, Finite Element Analysis, Probability & Statistics, Civil Engineering Design I & II

B. TECH IN CIVIL ENGINEERING, JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY [JULY 2017 – MAY 2021]

CPI = 9.21 / 10 (3rd Rank in Department)

Major Subjects – Concrete Technology, Strength of Material I and II, Design and drawing of Reinforced Concrete Structures, Structure Analysis I and II, Design and drawing of steel Structures, and Prestressed Concrete

SKILLS

- Soft Skills – Data Analysis, Plaxis, ABAQUS, MATLAB, AutoCAD, Revit, ETABS, SAP 2000 and MS Office Packages.
- Proficient in English communication (**IELTS: 6.5** - L: 6.5, R: 6.5, W: 6.0, S: 6.0).
- Hard Skills – Independent Researcher, Team Player, Leadership skills, Efficient Communication.

PUBLICATIONS AND CONFERENCES

1. **Yadav, U.S., & A.K. Jha** (2025). Enhancing Mechanical Characteristics of Fly Ash and Fly Ash–Stone Dust Using Geopolymerization Technique. *Journal of Hazardous, Toxic, and Radioactive Waste*, DOI: <https://doi.org/10.1061/jhtrbp.hzeng-1416>
2. **R. Gautam, R. Jaiswal, U.S. Yadav & A.K. Jha** (2025). Predicting Freeze-Thaw Resistance in Geopolymer Concrete: An Interpretable ML Model with Practical Deployment. *ASCE's Journal of Materials in Civil Engineering*. (Accepted).
3. **Yadav et al.**, (2025). Exploring the Influence of Fly Ash, Rice Husk Ash, and Recycled Concrete Aggregates on Sustainable Concrete Production. *An International Conference Series of Nepal Geotechnical Society on Geotechnics for Sustainable Infrastructure 2025*. (Accepted).
4. **Yadav, U.S., & A.K. Jha** (2025). Enhancing Strength Behavior of Fly Ash by Using Geopolymerization Technique as A Replacement of Cement in Producing Construction Material. *An International Conference Series of Nepal Geotechnical Society on Geotechnics for Sustainable Infrastructure 2025*. (Accepted).
5. **Yadav et al.**, (2025). Durability Assessment of River Aggregate in Natural, Immersed, and Chemically Treated Conditions. *An International Conference Series of Nepal Geotechnical Society on Geotechnics for Sustainable Infrastructure 2025*. (Accepted).

TRAINING AND PROJECTS

- M.Tech Research Project on “**Enhancing Mechanical Characteristics of Fly ash and Fly Ash-Stone Dust using Geopolymerization Techniques**”.
- Worked on the microanalysis (**MIP Analysis, XRD, FSEM, EDAX**) of the **geopolymer samples** to study the microstructure, phase composition, elemental distribution, and pore characteristics of geopolymer samples.
- Presented “A Geo-Environmental map for the sustainable development of the Kathmandu Valley, Nepal” in the research seminar conducted by Civil Department of IIT Patna.
- Member of Organizing team of National Seminar conducted by IIT Patna on "Nature-inspired Technologies for Carbon Sequestration and Ground Engineering”
- Worked on B. Tech Major Research Project – “**Study and Optimization of Concrete Mix Design for Improved Strength and Durability**”
- Worked on B. Tech Minor Research Project – “**Advanced fiber reinforced concrete mix designs.**”
- Worked on the Project “Construction of rigid pavement along Mai Khola Biblayte Section in Mechi Highway” which involved the **design of concrete road and quality control during the construction.**
- Designed the sedimentation tank and checked the sensitivity analysis of all the related parameters using **MATLAB** software.

REFERENCES

1. Dr. Nripojyoti Biswas (Ph.D. Supervisor)
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2. Dr. Arvind Kumar Jha (M. Tech Project Supervisor)
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