

# Er. ANGEL MAINALI

Civil Engineer · Hydropower Infrastructure · Structural Design & Coordination

■ Kathmandu, Nepal ■ Er.Angel.Mainali@gmail.com ■ +977 9840185500

■ LinkedIn ■ GitHub ■ erangelmainali.com.np

## PROFESSIONAL SUMMARY

Dedicated Civil Engineer specialising in hydropower infrastructure design, structural assessment, and comprehensive project coordination. Currently serving dual roles on the **7.2 MW Shyam Khola Hydropower Project**, bridging complex technical design (consultancy) with procurement, logistics, and contract administration (developer). Highly proficient in ETABS, AutoCAD, and structural estimation. Uniquely equipped with the ability to engineer custom automation tools (AutoLISP, web extensions) that replace static, manual workflows with highly efficient, algorithmic solutions. First Division graduate with published research in seismic vulnerability and water infrastructure resilience.

## PROFESSIONAL EXPERIENCE

### Assistant Construction Project Engineer (Consultant)

*Gorkha Hydro & Engineering Pvt. Ltd. — Kathmandu, Nepal*

May 2024 – Present

Serving as the core civil design and technical consulting lead for the Shyam Khola HPP (7.2 MW).

#### Hydropower Structural & Alignment Design

- Executed detailed design and stability analysis of penstock anchor blocks (AB), including complex manual checks for the critical bifurcation block.
- Calculated bend angles, plotted new alignments for penstock and headrace pipes, and updated design Ground Levels (GL) based on OGL data from site engineers.
- Designed 5+ critical river crossing structures, iterating through steel trusses, I-beams with saddle plates, twin columns, and masonry structures with orifices and wing walls.
- Generated exhaustive cross-sectional profiles (every 10 m) for the 1.5 km headrace and 4 km penstock alignments.

#### Structural Modelling & Verification (ETABS / AutoCAD)

- Modelled and verified structural integrity using ETABS — M10 reservoir structures, powerhouse roof trusses, and support pier capacities against multi-hazard loads.
- Drafted comprehensive powerhouse 2D plans, redesigned powerhouse cranes, and verified electro-mechanical (EM) layout drawings against civil blueprints.
- Conducted desk studies and topographical plotting for Karnali Khola and Musi Khola projects.

#### Estimation & Value Engineering

- Prepared detailed BOQs and cost estimates for powerhouses, tailraces, weirs, flood walls, and river crossing trusses.
- Executed material cost comparisons (HDPE vs. M10 vs. M20 for reservoir construction).
- Verified Bar Bending Schedules (BBS) for the powerhouse and generated BBS/BOQs for all river crossings.

#### Engineering Workflow Automation

- Developed a proprietary library of 100+ AutoLISP scripts automating repetitive drafting tasks: instant RL interpolation, direct CSV coordinate import/export, 3D AB generation from 2D profiles, and one-click L-section/cross-section/pier plotting.

### Assistant Project Coordinator

*S.K Energy Development Ltd. — Kathmandu, Nepal*

May 2024 – Present

Managing developer-side operations, procurement, and contract administration for the Shyam Khola HPP (7.2 MW).

#### Procurement & International Logistics

- Managed complex international procurement for EM equipment from India (TPES) and Q345b pipes from China — handling commercial invoices, bills of lading, and BiBiNi bank documents via Sanima Bank.

- Tracked regional material rates (Riddhi Siddhi PPC cement, diesel) and executed price adjustment/escalation calculations leveraging Nepal Rastra Bank (NRB) indices.

### **Contract Administration & Compliance**

- Liaised with the Department of Electricity Development (DOED) to secure equipment import approvals and Generation License compliance.
- Administered official project correspondence with civil, HM, and EM contractors and lead financial stakeholders (Sanima Bank).
- Evaluated technical and financial bids, prepared tender notices, checked IPCs, and issued Good Receive Notes.

### **Site Assistant (Contract)**

*SY Panel Contractor — Jhapa, Nepal*

Jul 2023 – Aug 2023

Measured and documented complex building floor plans to create baseline datasets for accurate material estimates and localised cost projections.

## **ENGINEERING SOFTWARE & AUTOMATION TOOLS**

---

*Leveraging applied automation to solve civil engineering bottlenecks and ensure design code compliance.*

### **AnchorBlock Pro — [Chrome Web Store](#)**

Automates the AEPC 10-Force method for penstock anchor block stability analysis. Replaces hours of manual trigonometry with instant, verified calculations for sliding, overturning, and bearing capacity.

### **Zila Landkit Nepal — [zila-three.vercel.app](#)**

Live Chrome extension streamlining Nepalese land survey and property record workflows. Features district-aware logic to compress hours of manual Lalpurja documentation into seconds.

### **HajirBook — [hajirbook.vercel.app](#)**

Architected a premium workforce attendance and payroll management system designed specifically for localised engineering offices and decentralised construction site operations. Solves proxy-attendance risks on remote sites using customisable GPS geofencing (10m–500m), processes dynamic payroll logic (bonuses, fines, pro-rata days), and generates official-grade PDF attendance ledgers localised with Bikram Sambat (BS) date conversion, custom letterheads, and QR code verification.

### **Pipe Stress & Bending Calculator**

Instantly calculates pipe bending angles and stresses, optimising the exact distance required between support piers.

### **Zila Cost Estimator**

Platform for stochastic construction cost estimation, generating dynamic BOQs with regional rate variations across 50+ Nepalese districts based on DOLIDAR/DOR standards.

### **AdComply AI — [angel97-cyber.github.io/adcomply-ai](#)**

Zero-backend browser utility automating legislative compliance (EU AI Act, NY Law) for synthetic media — injects machine-readable IPTC/EXIF metadata and visible watermarks into digital assets.

### **HSE Field Auditor**

*(In Development)* Mobile-first HSE checklist and audit tool with offline-first sync and automated compliance-ready PDF report generation.

## **EDUCATION**

---

### **Bachelor of Engineering in Civil Engineering**

*Tribhuvan University, IOE Thapathali Campus — Kathmandu, Nepal*

Graduated August 2025

- **Grade:** First Division
- **Awards:** Best Final Year Project (2025) — Selected by the Department Project Committee
- **Key Coursework:** Earthquake Resistance Design of Structures, Rock Engineering, Time Series Analysis

## **RESEARCH, PUBLICATIONS & PRESENTATIONS**

---

Acharya, A., Dahal, A., Jha, A. K., **Mainali, A.**, et al. (2026). "Seismic Assessment of a Masonry Building in Patan, Nepal." *Journal of Engineering Issues and Solutions*, 5(1), 1–29. [DOI: 10.3126/joeis.v5i1.93424](#)

→ 3D non-linear pushover analysis (DIANA FEA 10.5) generating fragility curves for traditional heritage masonry, verifying capacity against NBC 105:2020.

Dahal, A., Mainali, A., Acharya, A., Gurung, S. B., & Karki, B. K. (2025). "WASH infrastructure in Nepal: vulnerability, resilience to disasters, and mitigation strategies." *Water Practice & Technology* (IWA Publishing), 20(7), 1584–1602. DOI: [10.2166/wpt.2025.089](https://doi.org/10.2166/wpt.2025.089)

**NAST Presentation (August 2024):** "Seismic Assessment of Patan Masonry." Presented at the Nepal Academy of Science and Technology.

## TECHNICAL SKILLS

---

**Civil & Structural Software:** ETABS, SAP2000, AutoCAD, DIANA FEA, STAAD.Pro

**Core Competencies:** Hydropower Infrastructure Design, Structural Estimation, BOQ Preparation, Procurement Logistics, Contract Administration, AutoLISP Automation, Seismic Assessment (Pushover, NBC 105:2020)

**Programming & Automation:** Python (Pandas / Matplotlib), AutoLISP (CAD scripting), TypeScript & React (rapid tool prototyping), AI-Assisted Chrome Extension Development

**Languages:** English — IELTS Academic 7.5 | Nepali — Native