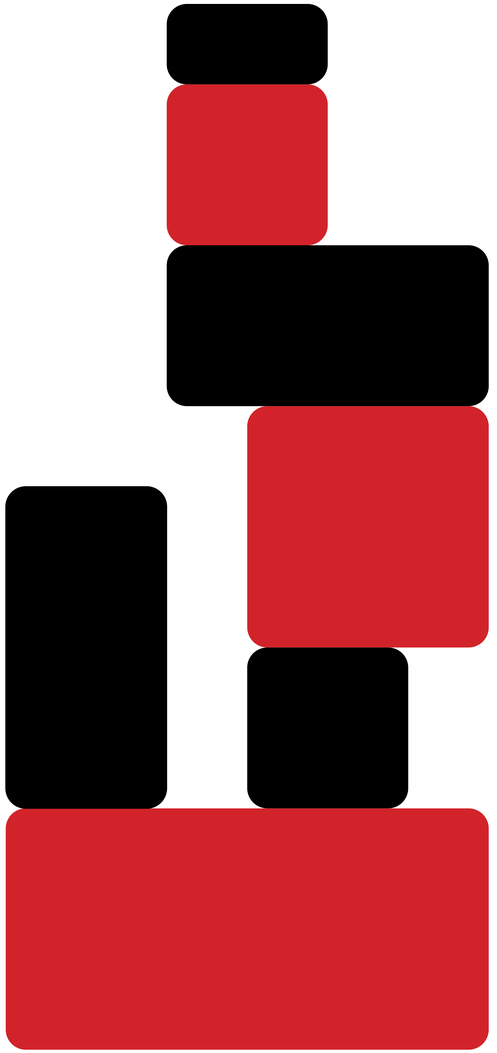
SÉVAG WILLEMOT

ENGINEERING & COMPUTATIONAL DESIGN PORTFOLIO



BRIDGING INTENT & EXECUTION

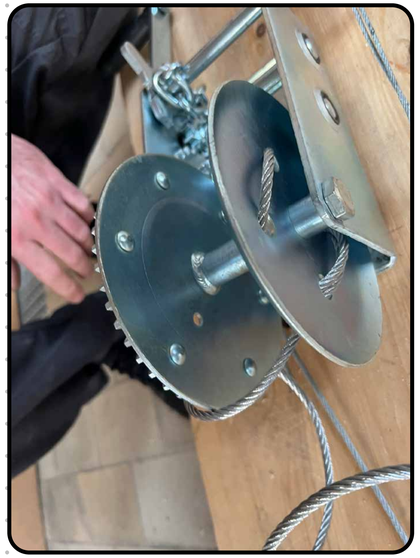
My goal is to optimize complex engineering workflows by bridging technical constraints with digital innovation. I leverage algorithmic logic, structural analysis, and operational leadership to deliver efficient and data-driven solutions.

CORE COMPETENCIES:

- Computational Design & AI.
- Structural Engineering.
- Parametric Logic & Tool Making.

WOOD CHALLENGE AWARD
CREATIVITY & INGENUITY



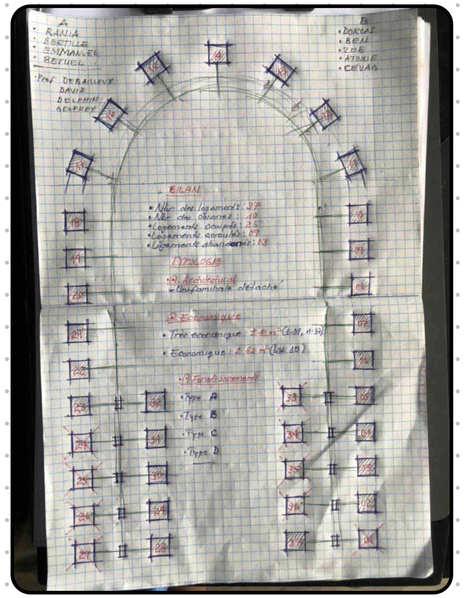
THE CHALLENGE:

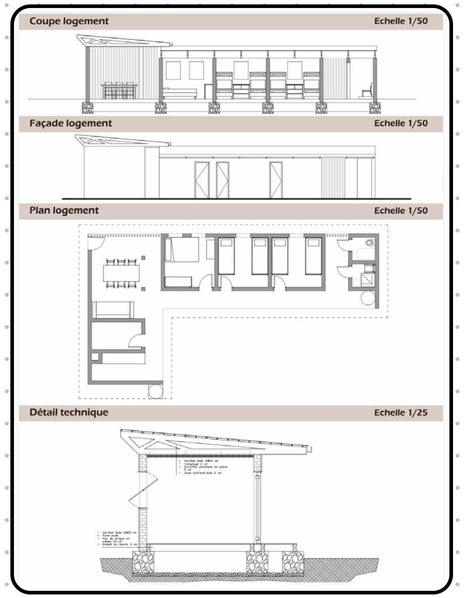
- Timber structure with the longest cantilever, using limited sections (max 45×45mm).
- Achieved a 5m cantilever with a structural dead weight of only 66kg.
- Engineered a kinetic tilting system driven by a winch to facilitate user accessibility.

HUMANITARIAN CONSTRUCTION
FRUGAL INNOVATION

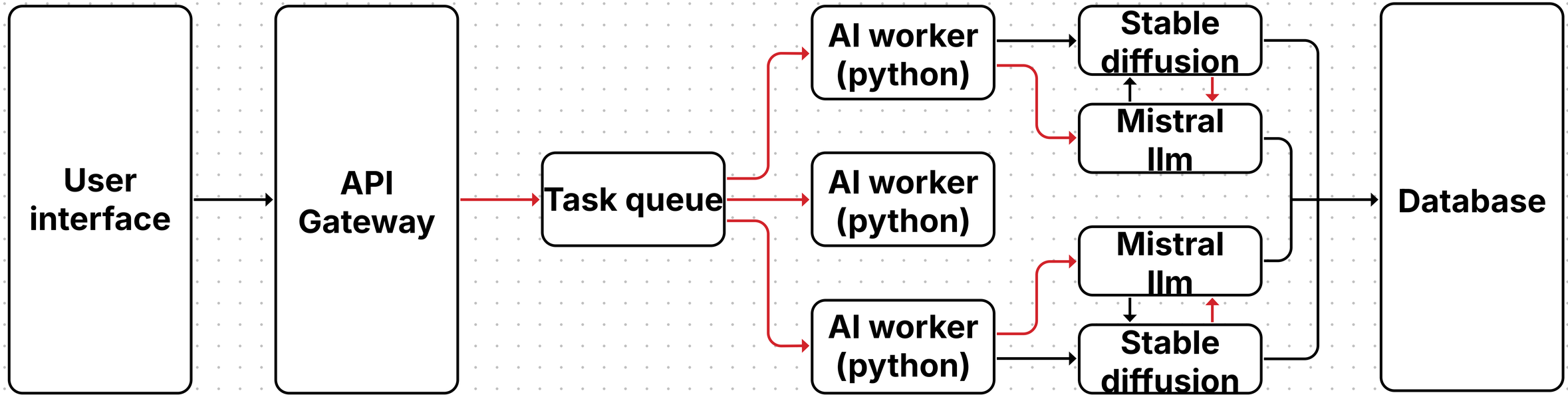
CONTEXT REHMOK :

- Rehabilitation of a rural camp in the DRC (Mokamo). Design of sustainable housing.
- Raw Earth as a locally sourced, ecological, and cost-effective alternative to concrete.
- Adapting execution plans to material constraints and cross-cultural communication.





COMPUTATIONAL WORKFLOW & DATA ARCHITECTURE



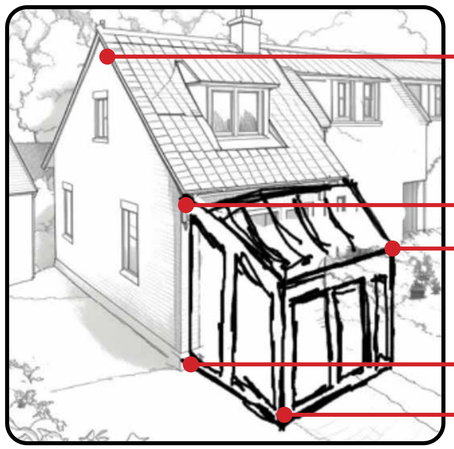
FINAL YEAR PROJECT:

- Challenge: Managing requests between UI and heavy AI models.
- Solution: Implemented a modular Python backend with a queuing system.
- Key concepts: API RESTful design, JSON data handling, OOP structure.

AUGMENTING DESIGN
AI AS A COLLABORATION MEDIUM

PROCESS & IMPACT:

- From a rough sketch to a visual in under 0.5 seconds. The user adjusts style and materials to iterate. Allowing architects to explore multiple iterations.



HAND-SKETCH (INPUT)

AI processing

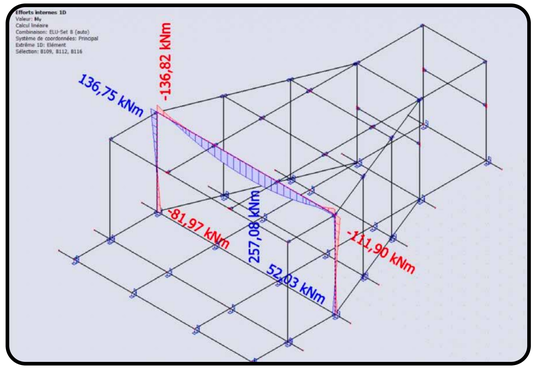
- Structure Encoding: Extracting edges from the sketch (Lineart).
- Latent Diffusion: Iterative noise refinement guided by the prompt.
- Image Synthesis: Final pixel generation in < 1 second.

3D VISUAL (OUTPUT)

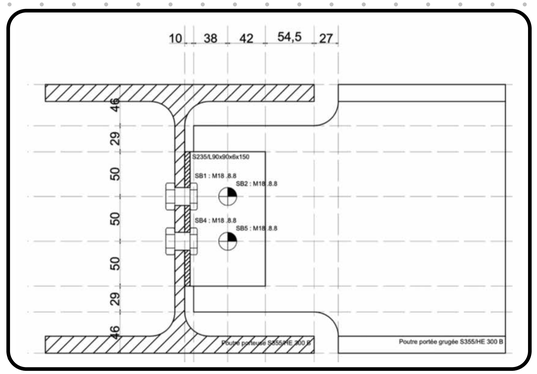
KEY BENEFIT:

- The AI acts not as a replacement, but as a “collaboration medium” bridging the gap between the architect’s intent and the client’s need for concrete visualization.

STRUCTURAL
ENGINEERING & ANALYSIS



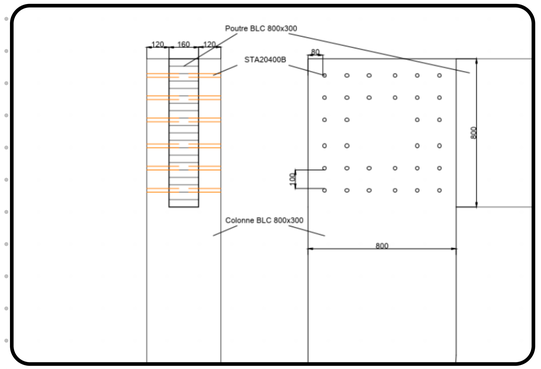
- Performed full axial and stability verification of a concert hall.



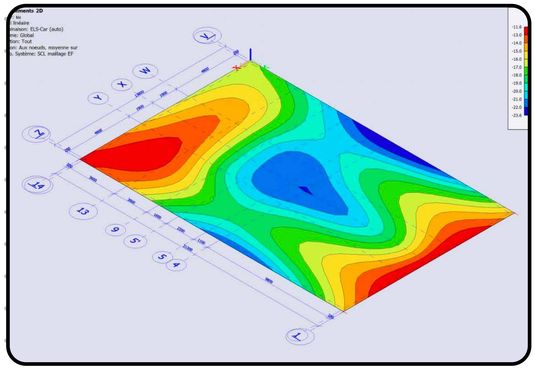
- Conducted capacity checks on steel components.

STRUCTURAL DESIGN PROJECT:

- Load calculation (dead, live, wind, snow).
- Element sizing (beams, columns, slabs).



- Calculated timber and timber-concrete connections.

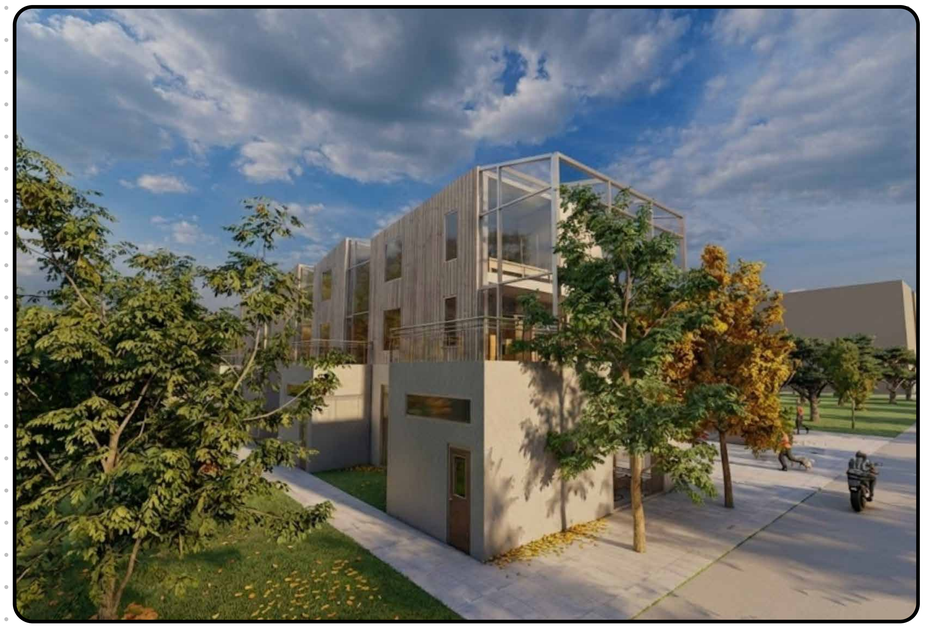


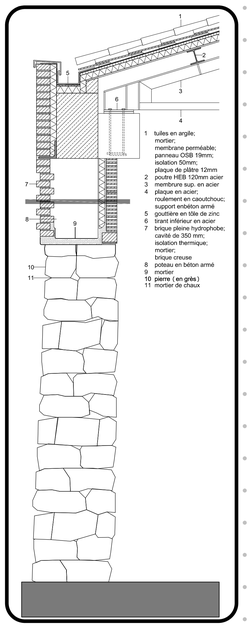
- Performed Finite Element Analysis of a reinforced concrete raft foundation.

ARCHITECTURAL DESIGN & BIM COORDINATION

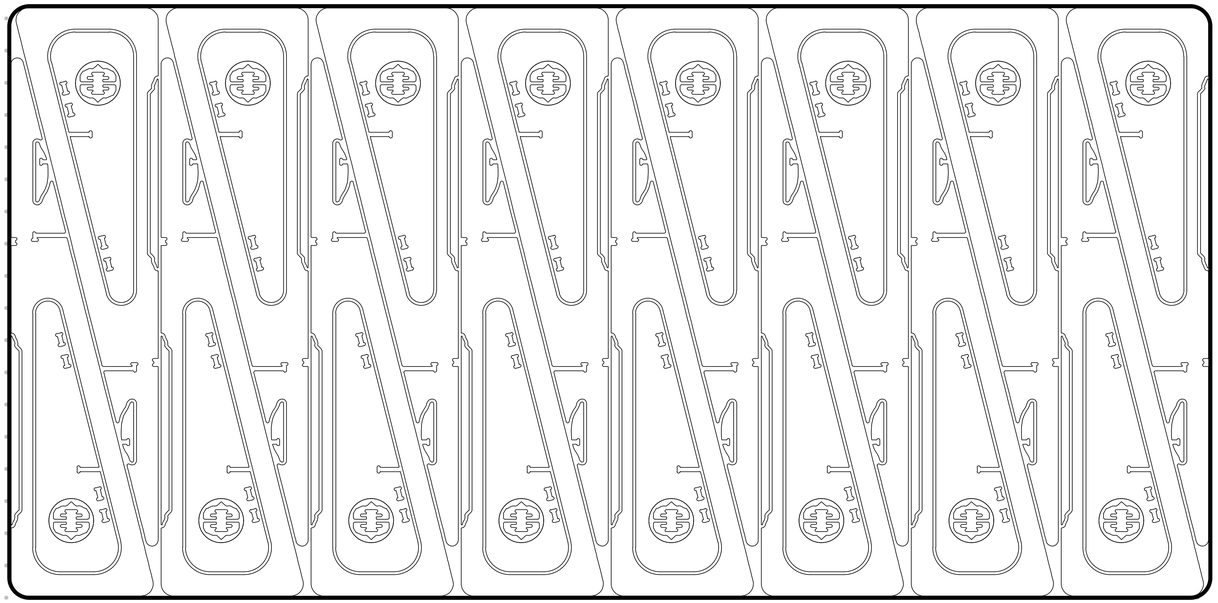
ARCHITECTURAL INTERNSHIP:

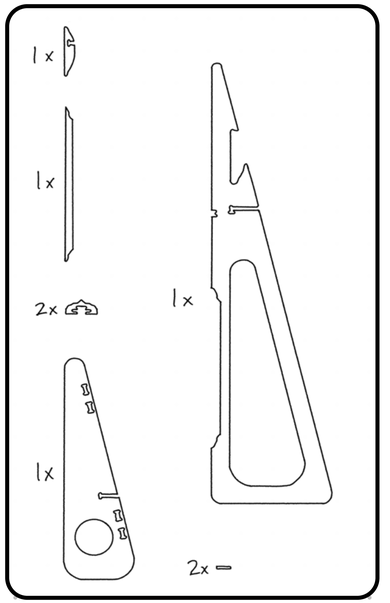
- Architectural BIM modeling and project plans, sections, and elevations.
- Coordinating architectural design with structural requirements.

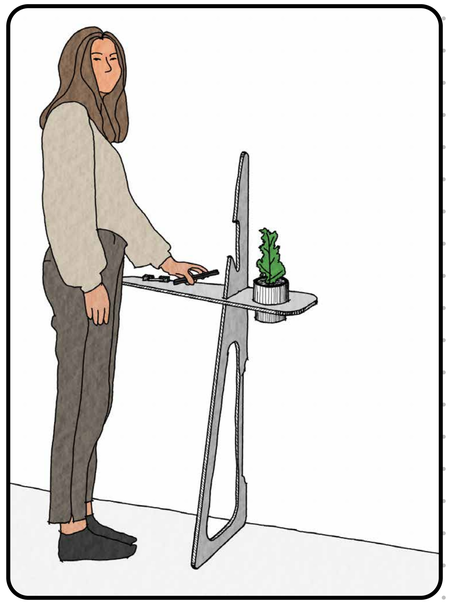




PARAMETRIC JOINERY & CNC OPTIMIZATION







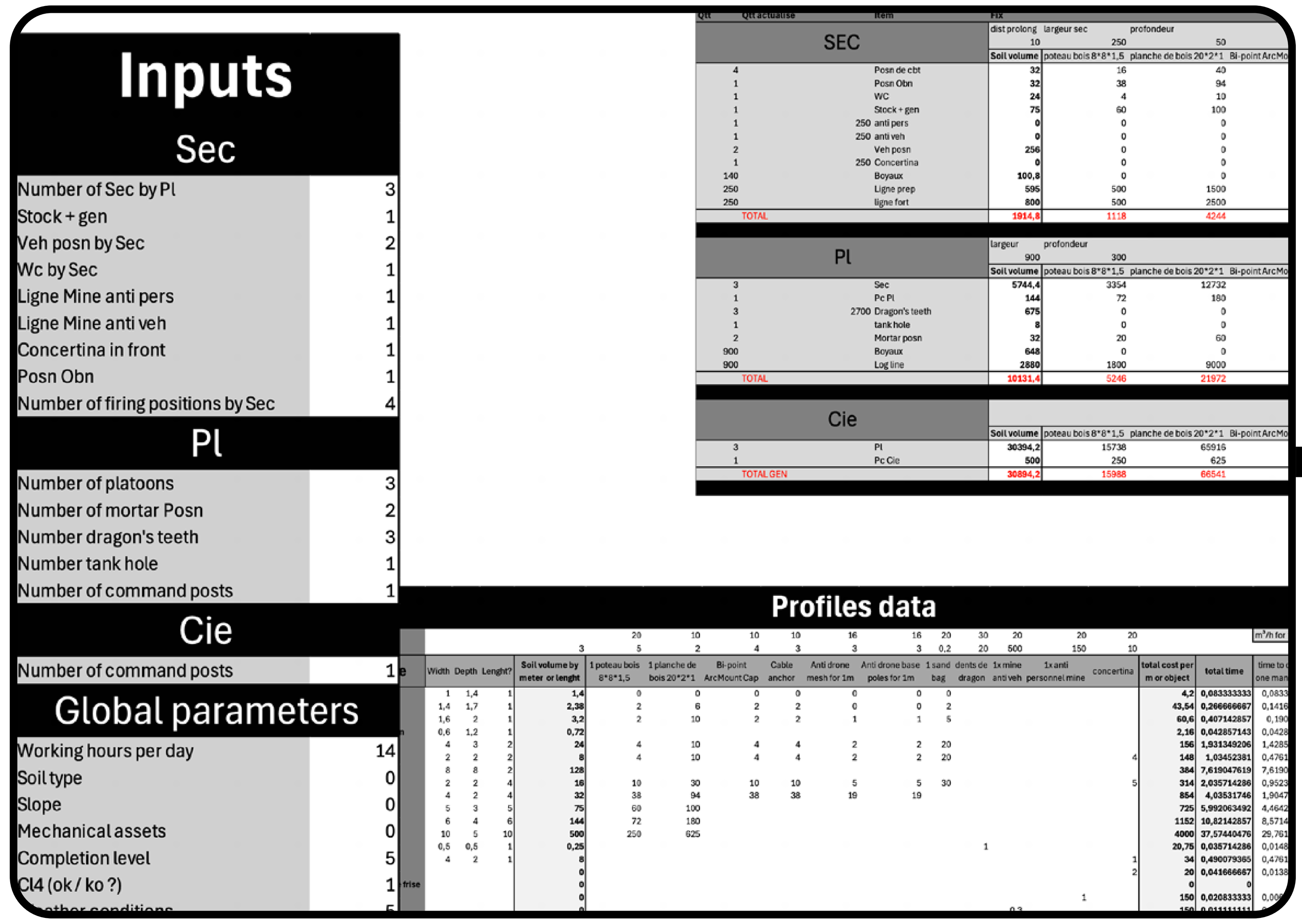
ACADEMIC PROJECT:

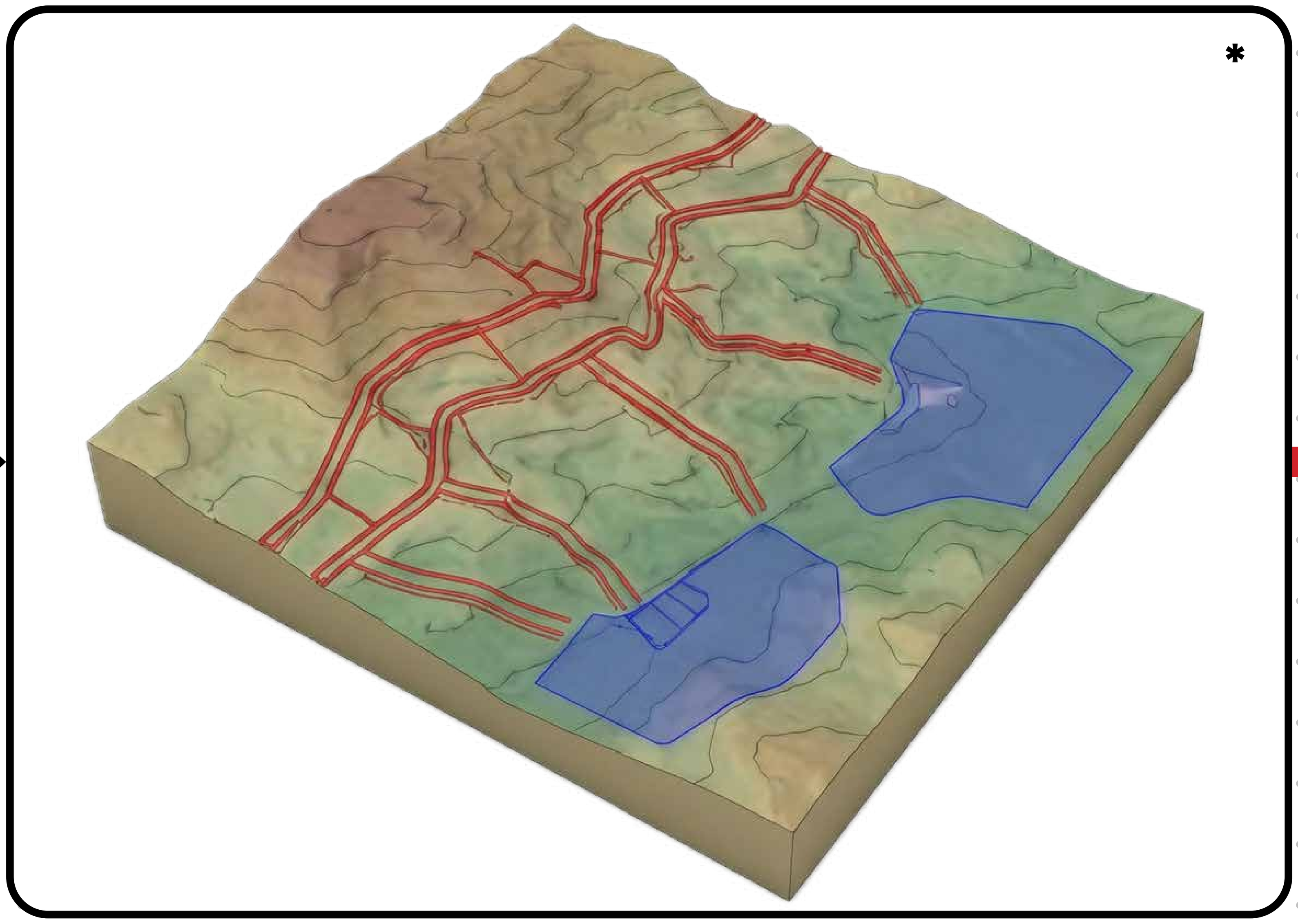
- **Design for Manufacture and Assembly applied to engineered wood components.**
- **Maximizing yield through nesting strategies.**
- **From an MDF panel (1220 × 2440mm) achieving a waste rate of only 9.14%.**

AUTONOMOUS TRENCHING FROM DOCTRINE TO DATA

ENGINEERING SOLUTION:

- A parametric tool for automated trench profile generation adapted to standardized specifications.
- Translating operational protocols into real-time machine actuation data.

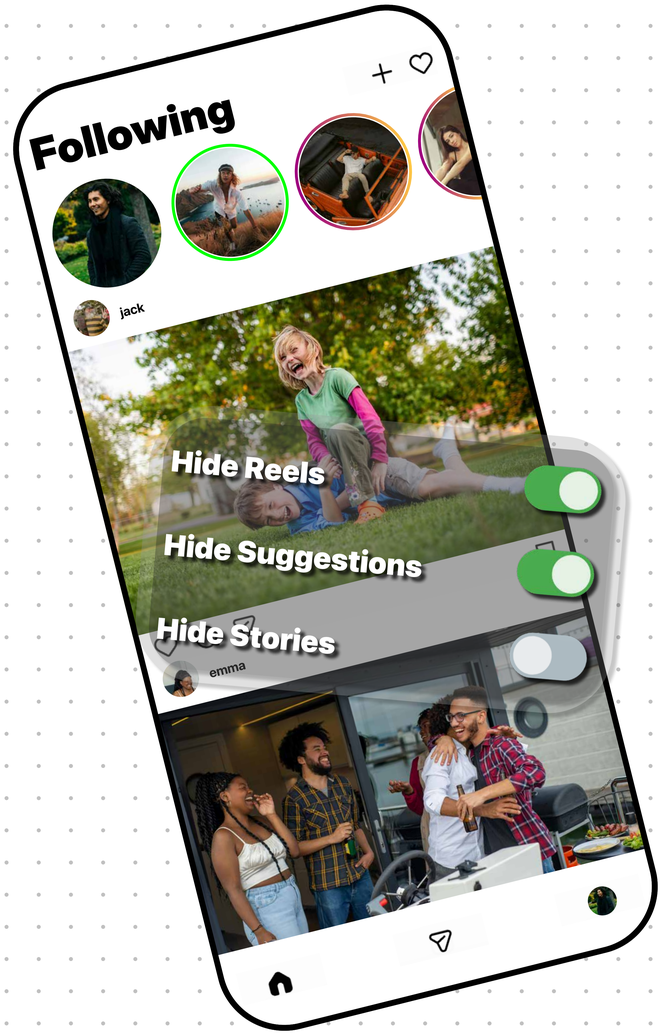




* Representation

DIGITAL WELLBEING & ALGORITHMIC FILTERING

PRODUCT ENGINEERING UNDOOMED



SOCIAL MEDIA FEED (Reels, Shorts, Explore) → **UNDOOMED FILTER (Local-First Logic)** → **CLEAN CONTENT (Messages, Friends)**

THE CHALLENGE:

- Infinite scrolling mechanisms
- complete blocking breaks UX

THE ENGINEERING:

- Cross-platform development
- Client-side filtering logic

KEY COMPETENCIES:

- UI/UX to Store deployment
- Full Stack Autonomy

TECHNICAL PROFICIENCY & CONCLUSION

PROGRAMMING

- Algorithmic Logic
- Python
- Visual Scripting

ENGINEERING

- Structural Analysis
- Sustainability
- Timber Engineering

ARCHITECTURE

- BIM
- Parametric Design
- Digital Fabrication

READY TO INTEGRATE RIGOROUS ENGINEERING WITH DIGITAL INNOVATION TO SOLVE COMPLEX CHALLENGES.