

FINAL YEAR PROJECT · B.TECH CIVIL ENGINEERING

Earthquake-Resistant Low-Cost Housing

Design study for rural homes

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01

INTRODUCTION

KEY IDEA

Safe rural house design is still handled manually in most places — slow, error-prone and hard to track.

Why this project matters



Introduction

- Safe rural house design matters to rural families and masons every day
- Current methods are manual, slow and hard to scale
- Affordable technology now makes automation practical
- This project builds earthquake-resistant low-cost housing as a working prototype

CONTEXT

Most rural families and masons we surveyed still rely on paper or spreadsheets for safe rural house design.



Problem statement

01

Manual work

Safe rural house design takes hours of repetitive effort.

02

Errors

Mistakes creep in and are hard to trace.

03

No insight

Rural families and masons lack data to make decisions.



Objectives

- Automate the core steps of safe rural house design
- Give rural families and masons a simple, mobile-friendly interface
- Store data securely and generate reports
- Evaluate the system against the existing process

02

LITERATURE & GAP



Literature survey

Study	Approach	Limitation
Study A	Rule-based automation	Not adaptive
Study B	Mobile data collection	No analytics
Commercial tools	Full-featured suites	Costly and complex

Representative summaries — replace with your own citations.



Existing vs proposed system

Existing system

- Manual records
- Slow turnaround
- No reports

vs

Proposed system

- Automated workflow
- Real-time dashboard
- One-click reports

03

PROPOSED SYSTEM



System architecture

1 Input

Data captured from users or sensors

2 Process

Core logic validates and analyses

3 Store

Secure database and backups

4 Output

Dashboard, alerts and reports



Block diagram

Every module talks through one simple, testable interface.

The system is built in layers: an input layer, a processing service, a database and a dashboard. Each layer can be tested independently, which keeps earthquake-resistant low-cost housing simple to maintain and extend.



Block diagram / flowchart



Technology stack

01

STAAD.Pro

Structural analysis

02

AutoCAD

Drawings

03

Shake table

Model testing

04

Local materials

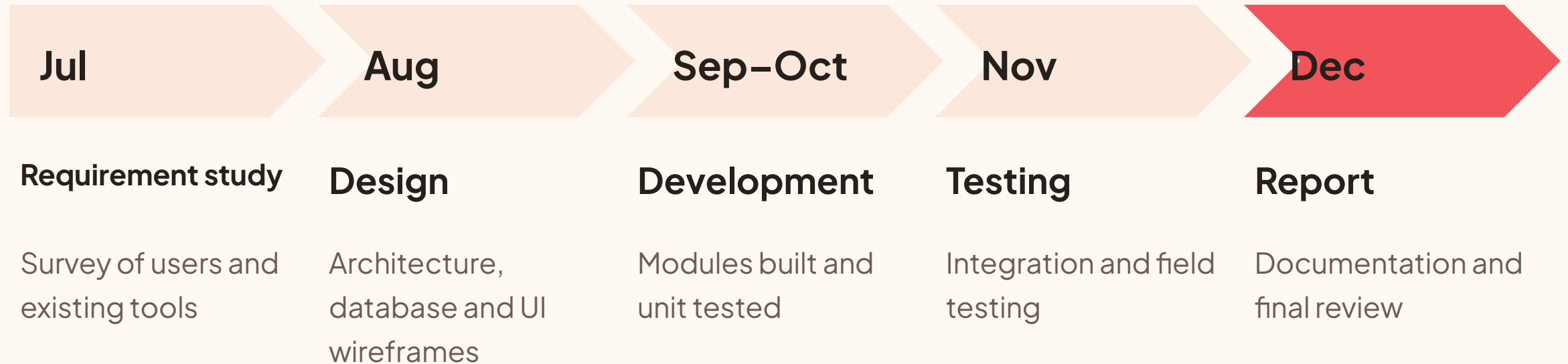
Brick and bamboo

04

IMPLEMENTATION



Project timeline





Implementation snapshots



Image 1

Main dashboard

Overview of live data



Image 2

Data entry

Simple forms with validation



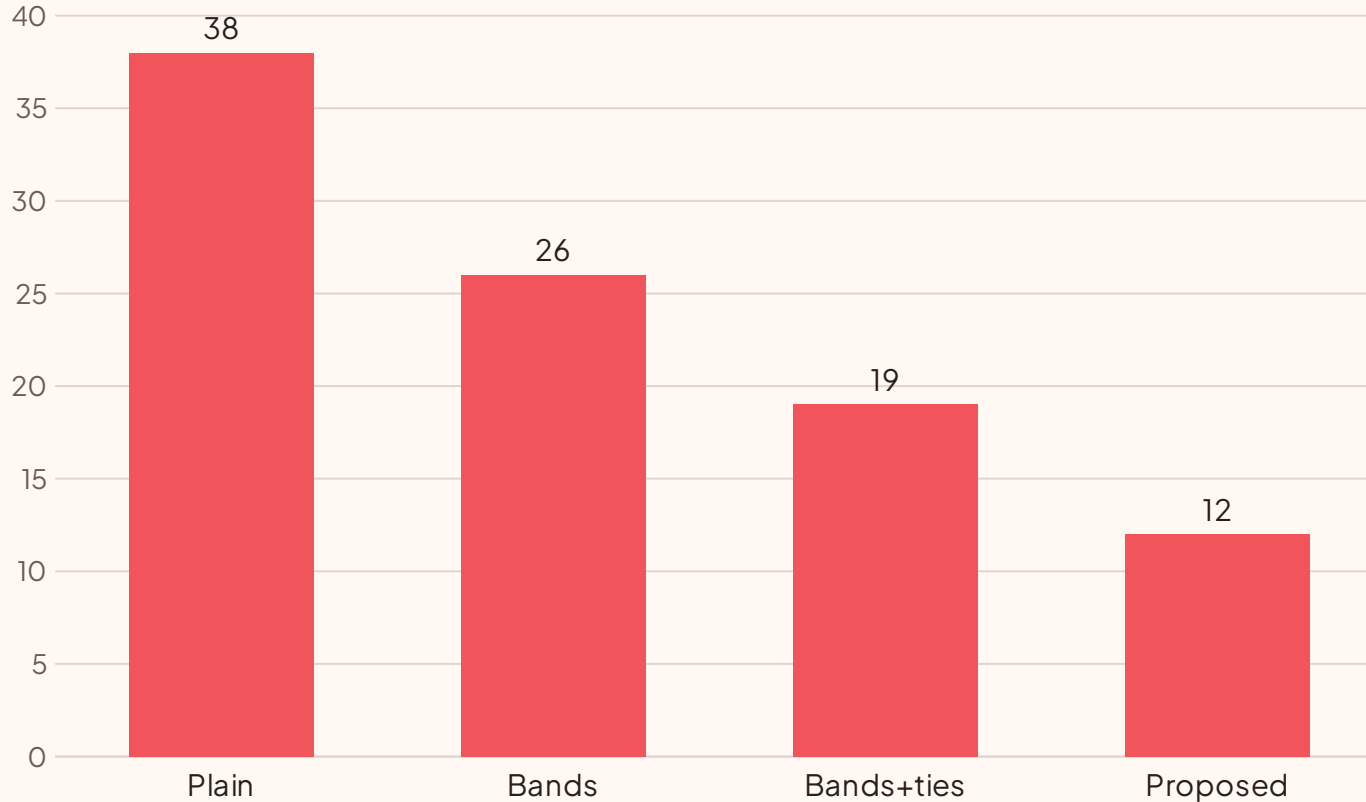
Image 3

Reports

Exportable summaries



Results



Sample data for illustration — replace with your own figures.

68%

less drift than a plain wall

The prototype improved steadily over the evaluation period (sample data).



Key outcomes

68%

less drift than a plain wall

100%

records digitised

< 1 s

average response

Figures from our test setup (sample data).



Conclusion

- Earthquake-Resistant Low-Cost Housing meets its main objectives
- Automation saves time and reduces errors for rural families and masons
- The design is simple to extend and maintain



References

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- [2] B. Author and C. Author, Book Title, 2nd ed. Publisher, 2022.
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Thank you

Questions and suggestions are welcome.

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