CEEn-2018CPST-005

Nepal Earthquake Recovery

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Introduction

Gorkha Earthquake

- 7.8 Magnitude
- April 25, 2015
- Killed 9,000
- Most of the deaths were due to collapsing buildings
- Most common building material – Heavy brick and stone

Design and Analysis

Alternative Materials

After extensive research, bamboo was determined to be the ideal material.

Engineering:
Bamboo is lightweight, high engineering values, and resistant to seismic loads as well. Bamboo can be combined in bundles to achieve necessary capacity.

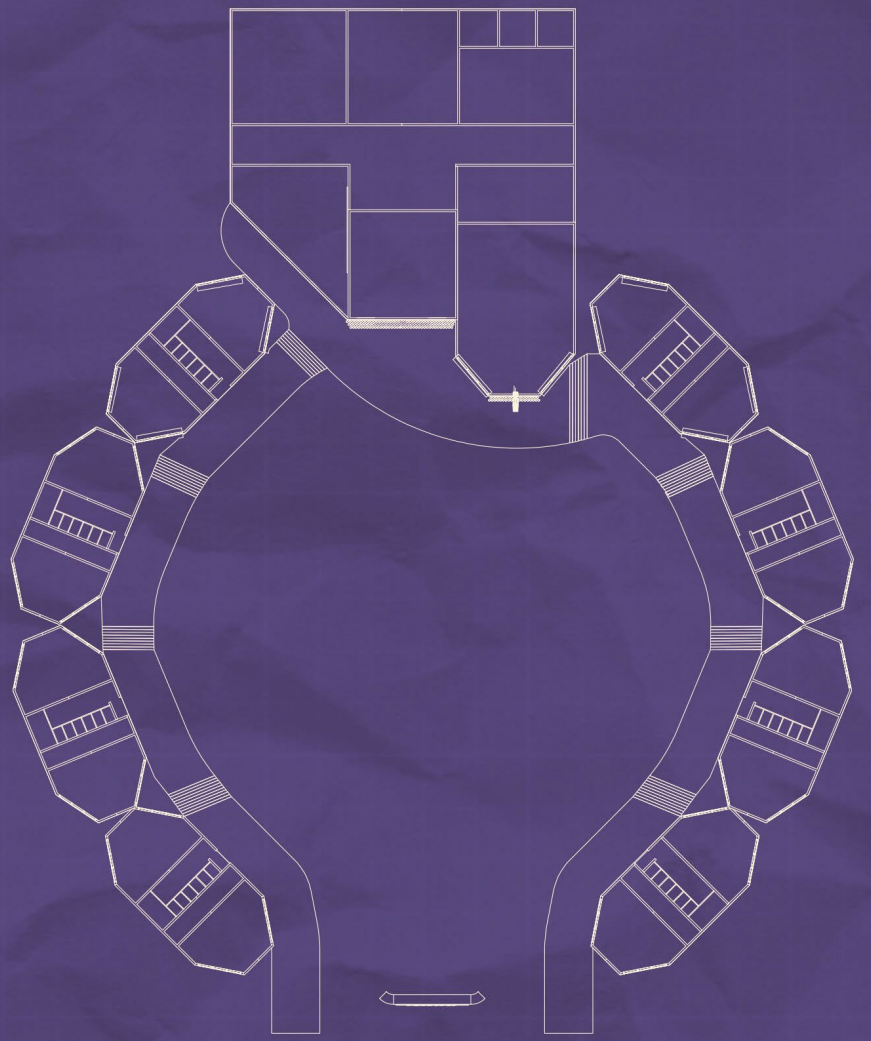
Sustainability
Native to the country, fast growing (full-grown in as little as five years)

Design and Analysis Cont'd

Architecture

Modular Design
Each classroom building is a self-contained unit, so the design can be modified to include more classrooms, change orientation, or adjust to site needs.

Courtyard
Circular orientation of classrooms allows for large central courtyard.



Discussion of Results

Structural Analysis

Spreadsheets
As not much work has been done previously in bamboo, all calculations were performed by hand. Properties were acquired from companies that produce bamboo products, and then analyzed with structural analysis software Forte.

Recommendations

Suggestions

All plans ought to be reviewed by a licensed structural engineer before use. Additional testing may be needed in the treatment of bamboo with borax, which was determined through research to be the most viable method. Finally, connections and configurations of bamboo rods to form columns may need additional testing to accurately represent its strength.

The End