

Permanent School Design

Conceptual Design



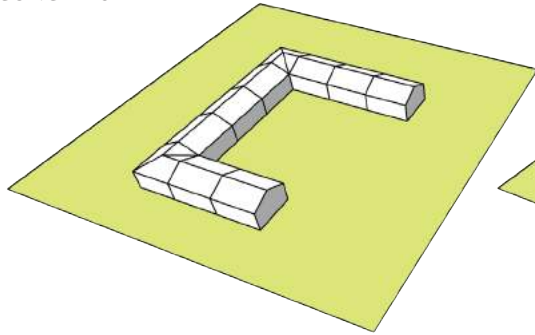


INTRODUCTION

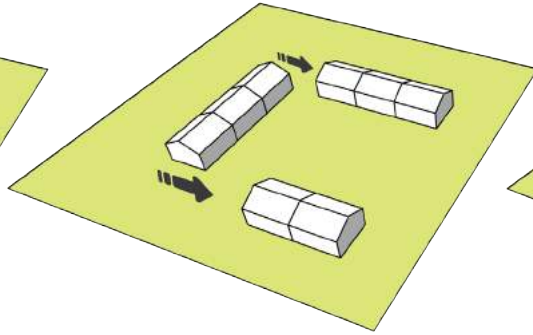
“The highest education is that which does not merely give us information but makes our life in harmony with all existence” -Rabindranath Tagore.

Our intention is to rethink the existing paradigm of educational spaces for children in Nepal post earthquake. The buildings will be made from locally sourced materials and constructed using modified vernacular techniques designed to create safer and inspiring structures. The school of Nepal's future will feature intuitive natural technologies as well as permaculture values in order to instill a strong sense of curiosity and thirst for knowledge in the children.

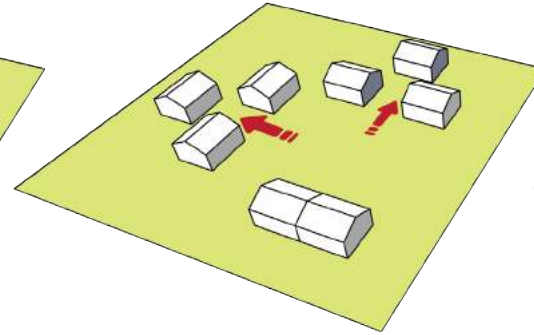
CONCEPTUAL



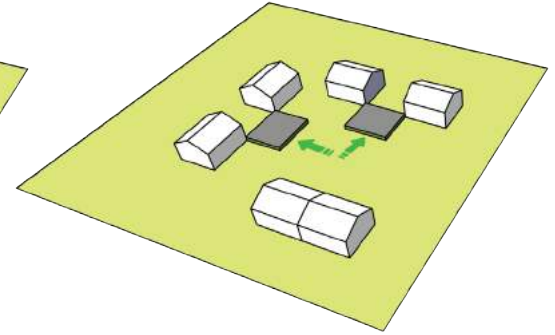
1 EXISTING TRADITIONAL CLASSROOMS
ALL OVER NEPAL



2 BREAKING DOWN OF THE MONOTONOUS
LAYOUT



3 REMOVING THE
CENTRAL UNIT



4 INTRODUCING A CENTRAL
INDOOR PLAY SPACE

The play space component is an integral part of the design and it will challenge the typical design of classrooms all over Nepal. This multi-functional space can be conceived for many functions such as an covered play space, an

art center, a small theatre and a communal space. Moreover, having a covered play space will allow the students to move and play around regardless of the weather conditions





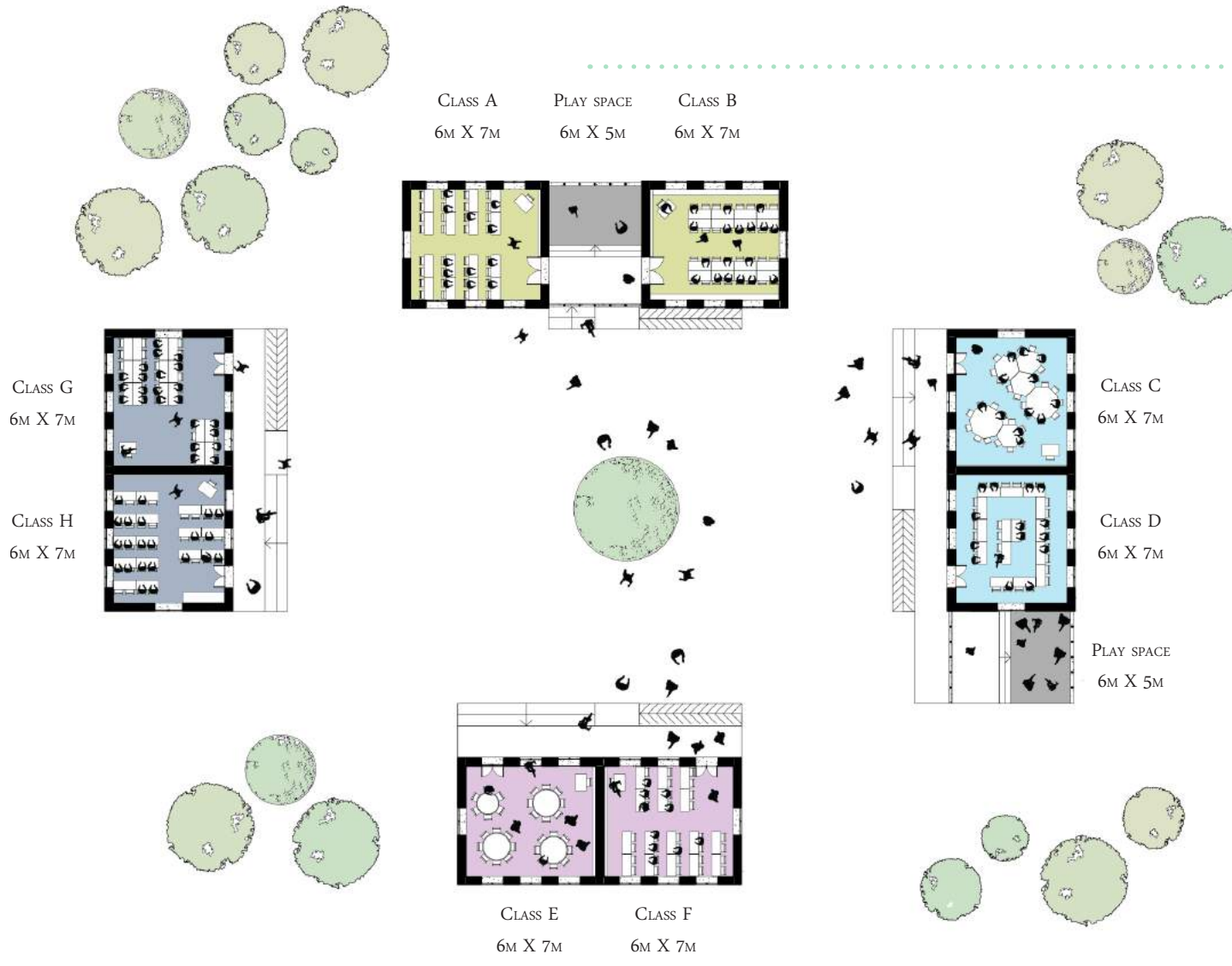
ART GALLERY COMMUNAL PLAY SPACE THEATRE

DESIGN

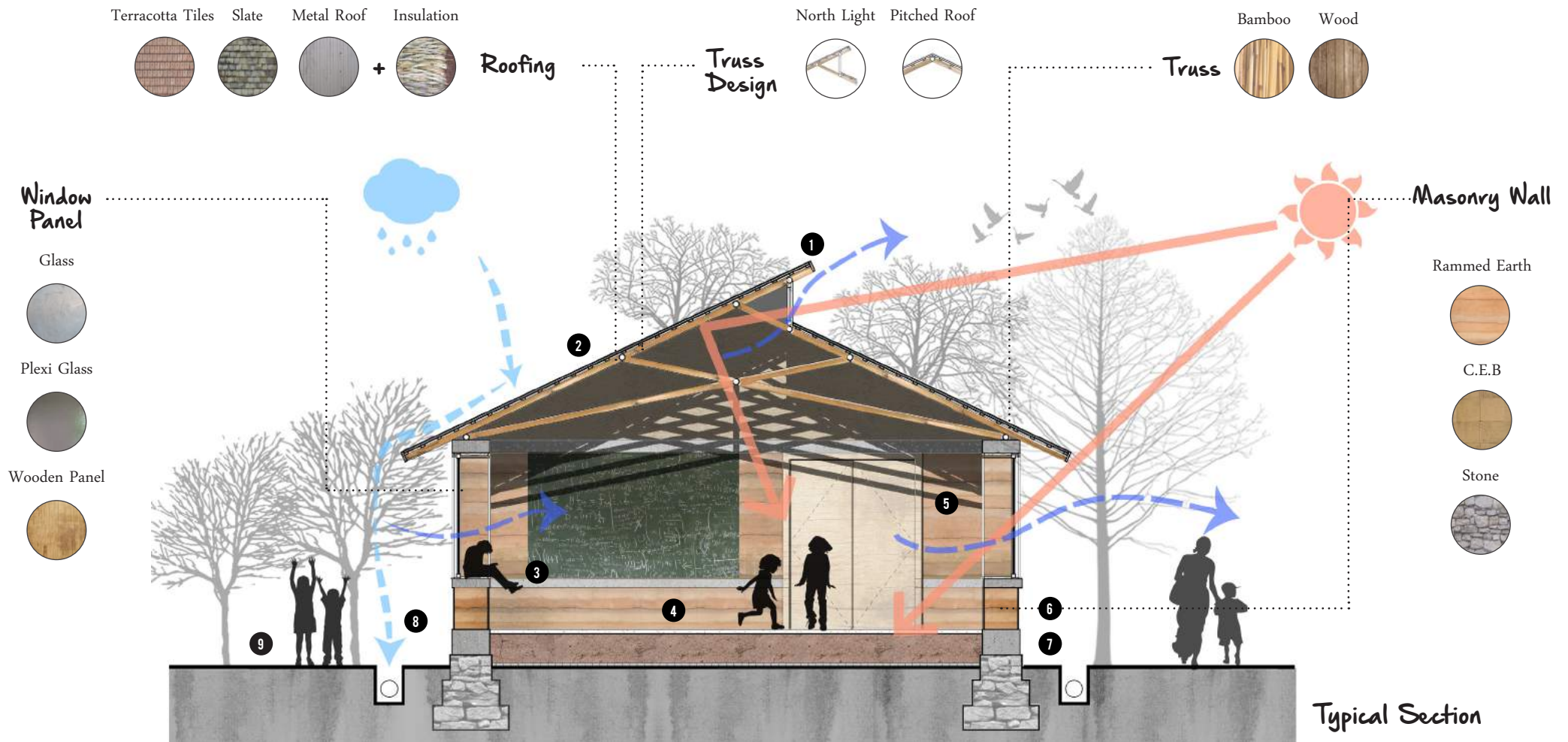
The permanent school designed by ABARI will be based on a modular framework which can transform and expand according to individual village needs and site conditions. It will be built using local, natural materials and will be climate responsive and have universal access.

Each module will house at least two classrooms with a basic size of 6m x 7m. An optional central covered play space can be created by pulling the classrooms apart. The classrooms will be designed in a “free plan” and can be arranged to fit different functions. For instance, the layout can be a traditional series of classrooms, an open plan for art spaces, or a collaborative arrangement for meetings and conference rooms. These classrooms will have a series of windows on both sides of the walls that are placed low to the ground. Not only do they guarantee much needed daylight in a classroom, the deep frames will also introduce a seating space for the children to gaze and interact with the outside world.

- THREE MODULE w/
CENTRAL PLAY SPACE
- THREE MODULE w/
ADJACENT PLAY SPACE
- TWO MODULE
- TWO MODULE



Conceptual Site Plan



MATERIALS

The materials used in construction will be local and traditional yet constructed with innovative contemporary building techniques. Almost all of the selected materials will retain their natural beauty and texture.

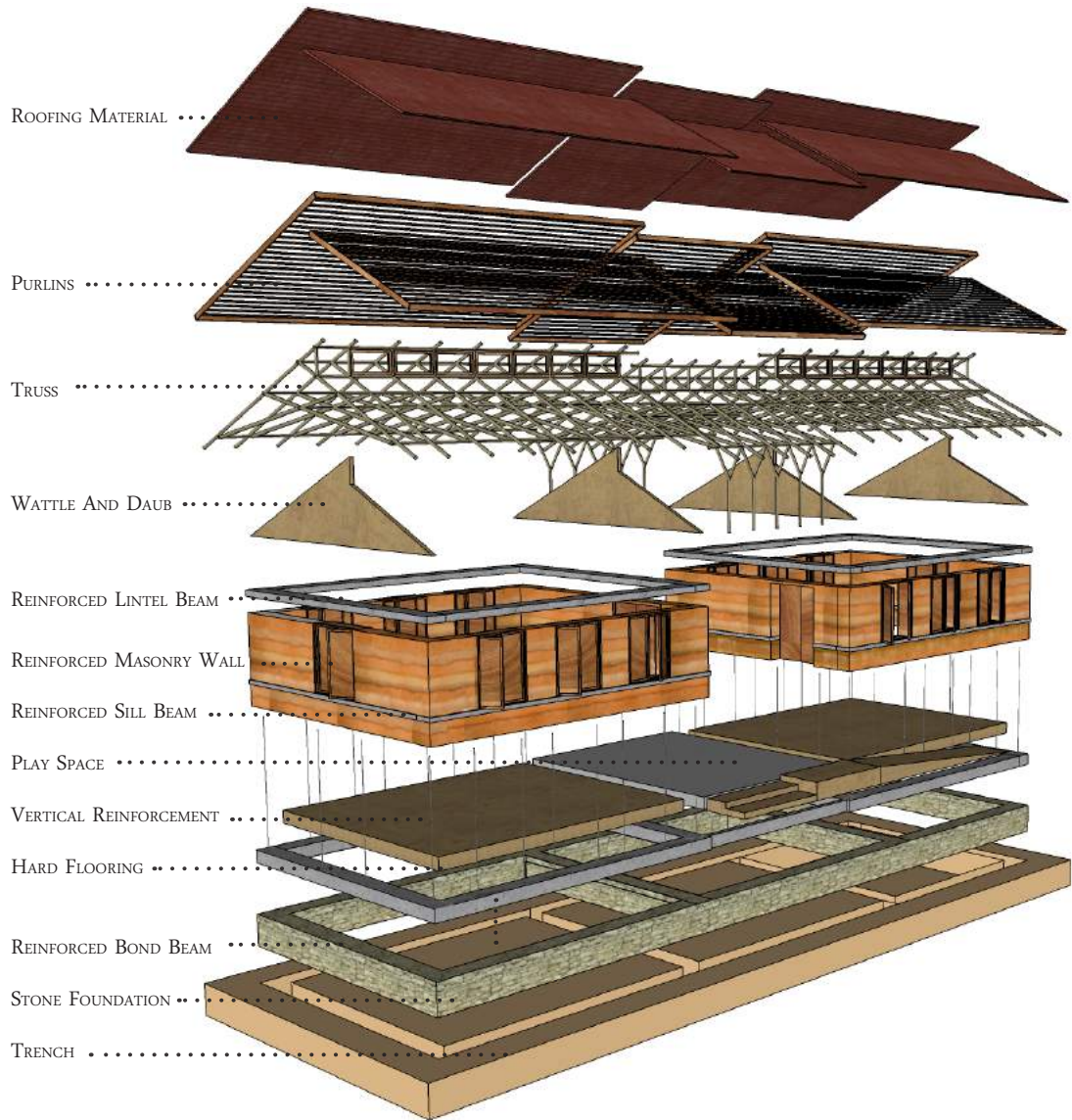
The selection of materials will be site specific and budget conscious. Choosing products that are widely available at or close to the build site will reduce transportation costs and respond more to the natural environment.

While the basic foundation for the structure will remain the same, there will be wide selection of materials for other building units. For the masonry structures, ABARI will be promoting rammed earth, stone, and compressed earth blocks.

The roofing materials will have options of traditional ceramic tiles, slate, and corrugated metal roofing with bamboo insulation. For the roof trusses, as per the availability, there will be options for bamboo and wood. Similarly for the window panels, options will be provided for glass, plexi-glass and wooden plank.

Typical Section

- 1 AMPLE NATURAL VENTILATION
- 2 INSULATED ROOF
- 3 INSPIRING STUDY ENVIRONMENT
- 4 AMBIENT ANNUAL TEMPERATURE
- 5 LOCALLY SOURCED MATERIALS
- 6 NON TOXIC NATURAL FINISHES
- 7 ENGINEERED + HAZARD RESISTANT
- 8 SMART WATER COLLECTION
- 9 CHILD FRIENDLY PLAY SPACE

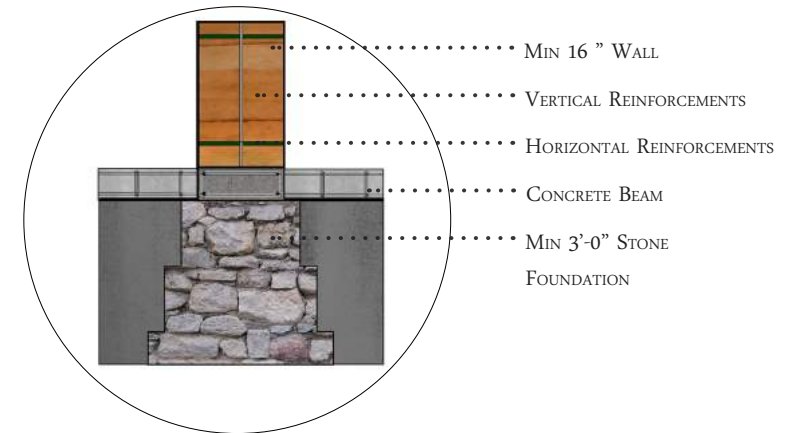


Exploded Isometric

CONSTRUCTION DETAILS

The structural design for each building will be multi-hazard resistant and will act as a model for earthquake resilient structures for the entire community.

The foundation of the structure will be composed of stone masonry with cement and sand mortar. The particular design details will be site specific with regards to the availability of the local materials. The bond beam which sits on top of the stone foundation will be of reinforced cement concrete. From the bond beam, as per the design, the vertical reinforcements will be installed for the masonry walls which will provide stability and strength for the whole structure.



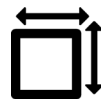
FOUNDATION DETAIL

MATERIAL SPECIFICATION OF RAMMED EARTH



MATERIAL COMPOSITE

Clay, Sand, Aggregates and Lime/Cement (Optional)



WALL THICKNESS

Minimum 400MM



COMPRESSIVE STRENGTH

4 KN/mm² to 8KN/mm²



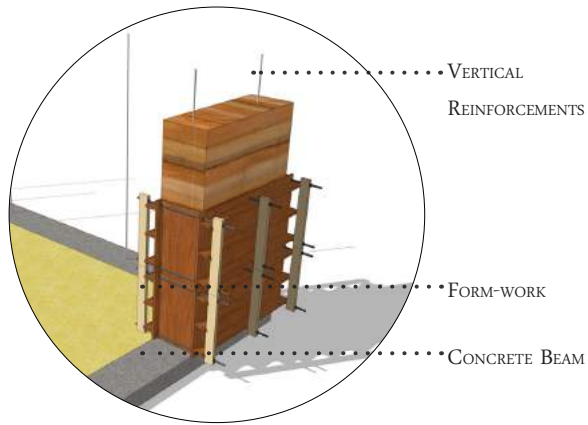
ANNUAL PASSIVE SOLAR TEMPERATURE

22-26 °C

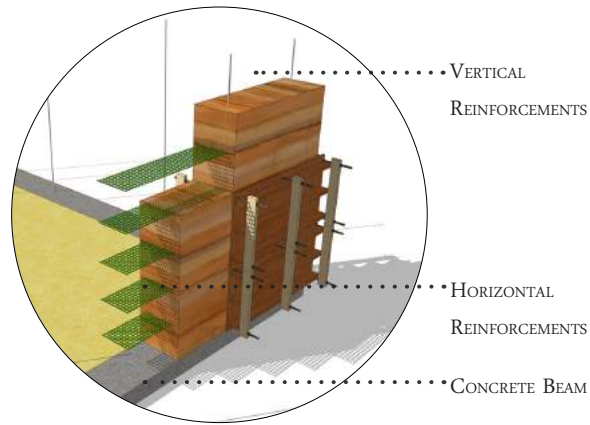


REINFORCEMENTS DETAILS

M20 Reinforcement Concrete
TMT 12mm - Main bars
8mm - Stirrups



INSTALLATION OF FORM-WORK WITH VERTICAL REINFORCEMENTS



INSTALLATION OF HORIZONTAL REINFORCEMENTS

As per the selection of the materials, the masonry walls will be raised with horizontal reinforcements at certain intervals. This will further reinforce the masonry walls. The windows will have a sill and lintel beam and all the doors will end at the same lintel level.

In addition to selecting an appropriate truss, the connection details will vary with the design. The truss will sit on top of the lintel beam and will have adequate and appropriate supporting mechanisms. The truss will be backed by purlins at certain intervals which will be defined by the selection of the materials. For the traditional ceramic tiles, a layer of flattened bamboo will be placed on top of the purlins with a thin layer of mud. The mud acts as a source of insulation and will help to level the entire roof. For corrugated metal roofing, an extra layer of flattened bamboo will be kept under them to provide insulation and maintain optimum level of indoor temperature.



Front Elevation

THE PHILOSOPHY

ABARI believes that through the hands on construction process with locals, not only is a building created, but a whole community can be empowered. The provided design for the school is considered flexible and we welcome involvement from the local community in both

the building and planning phase in order to reinforce a sense of ownership and pride. One of the objectives for this type of ecological building construction is to inspire others to imitate the new style of construction and foster a new trust in the local and vernacular materials.



COMPANY OVERVIEW

Abari is a socially and environmentally committed research, design and construction firm that examines, encourages, and celebrates the vernacular architectural tradition of Nepal. As Nepal possess sophisticated traditional knowledge of natural materials like adobes, bamboos, stones and reed, Abari as a research and design firm tries to promulgate these materials into contemporary design practices.

PURPOSE

To find alternative building material for concrete and steel.

VISION

Instigated by environmental consciousness, health, aesthetic and economic reasons that people are showing - even small - a reinvigorated interest to go back to natural building materials like adobe and bamboo. We are seeing a modest institutionalized effort to re investigate the traditional natural materials so that they can be re-appropriated to cater to the modern requirements in Nepal.

MISSION STATEMENT

To build homes made out of local resources that is earthquake resistant, healthier and modern sustainable alternative to the conventional housing practices.

GOALS AND OBJECTIVE

- Design and construct sustainable structures using traditional material like adobe and bamboo which is sensitive to the environmental, social, cultural and topographic conditions of the area.
- Rescue and redesign the traditional material like adobe and bamboo so that it can cater to the modern sensibility.
- Construct structures that can harness solar energy and use household waste for energy generation.
- Design structures that can effectively resist earthquake and flooding.
- Train and empower people on bamboo identifications and treatment, proper storage, joints connections, adobe manufacturing and other specialized construction methods.

APPROACH

Since Abari is research and design firm, it has developed different construction techniques that are unique to the Nepali conditions, so the presence of Abari is required from the design to the construction phase. In the work process, it will also train the local people about its specialized construction methods, so that the skills can be transferred to different regions.



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