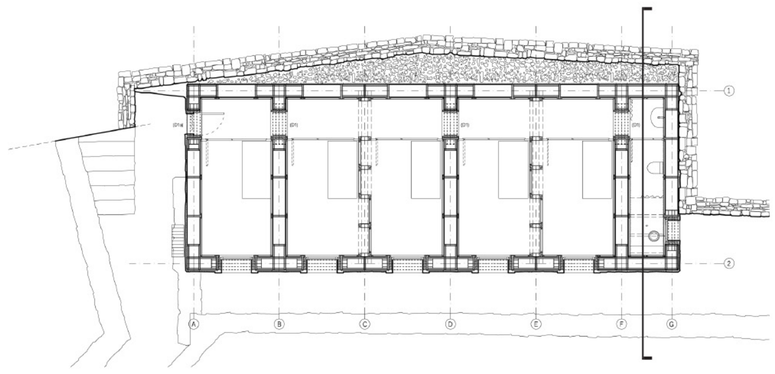
8th ICBR Lisbon I Nov 2018

Building 4Humanity
DESIGN COMPETITION

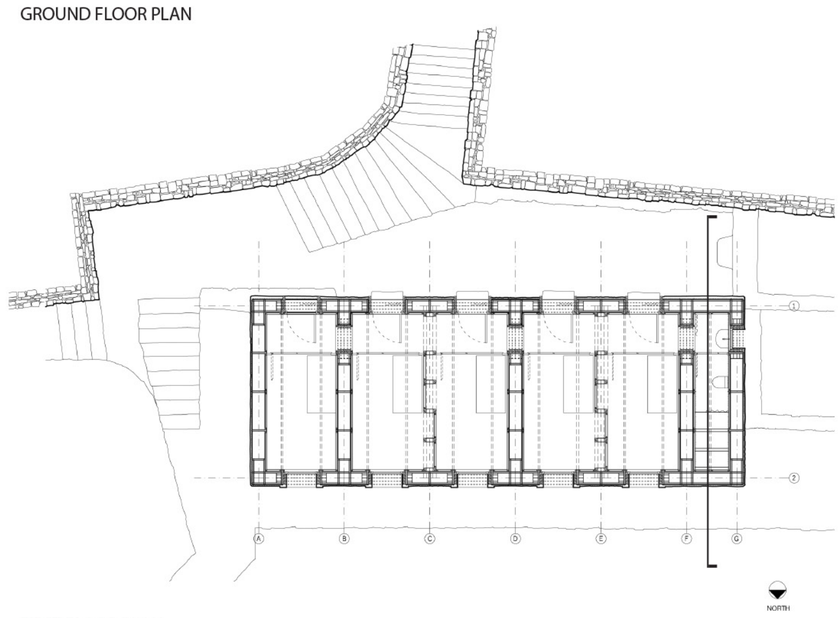
Category 1:
Resilient Projects (Built)

Team Project Coordinator(s): *Varun Amar Kaushik*
Team Members: *Scott Lloyd, David Stoeger*
Year of conclusion: *11/2017*
Location: *Thame village, Solu-Khumbu / Nepal*

TEAM CODE: **B4H-DC1167**



GROUND FLOOR PLAN



FIRST FLOOR PLAN

FRONT ELEVATION

1

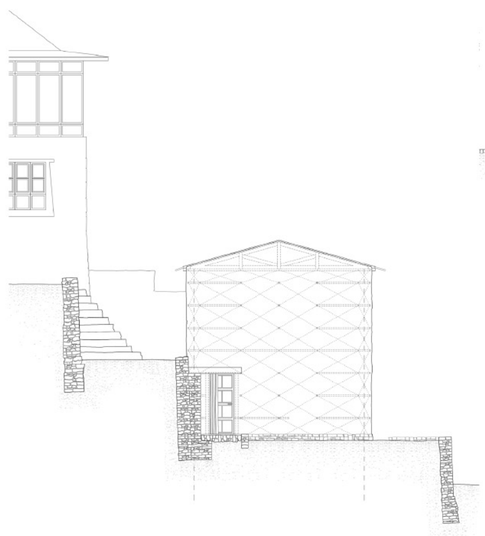
2

3

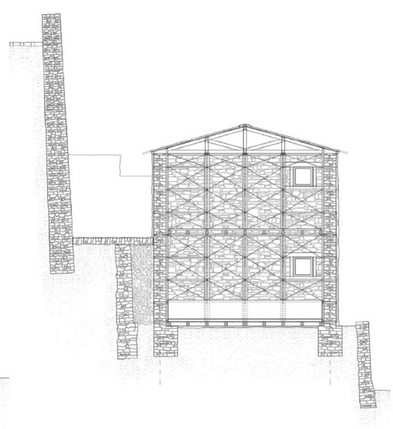
4

5

6



WEST ELEVATION



SECTION

An elegant and pure double storey building with slim roof and true aesthetics, sitting in the Himalayan landscape.

7

8

9

1. Showcasing local craftsmanship and perseverance, stone quarried at site, was chiseled into perfect orthogonal shapes to provide the building blocks for the hostel.

2. Timber frames were installed at every corner, T-junction and floor level to provide improved connectivity between perpendicular walls and help the building retain its structural shape during an earthquake.
Stablized mud mortar (lime:mud 1:10) was used to improve cohesion between two wyths of stone masonry. Once set, it will also help improve the weather protection properties of the building envelop.

3. Vertical timber members were used to connect every masonry frame to the roof trusses. This will help transfer the tensile properties of roof trusses, throughout the masonry, assisting it in safely respondig to lateral movements during an earthquake.

4 + 5. A mesh, made out of galvanized iron wire, is wrapped around the exterior of the building connecting all the timber frames. In turn providing increased tensile strength and containment for wall wythes. A cross weaving system was then evolved that was easy to work with at heights and once installed all around the building would effectively work even without nails and act as a wire skin for the building.

6. A slim roof line was designed to replicate the fragile edge in traditional slate roofing systems. In order to counter the strong wind uplift, a timber edge band (in 25mm planks) was installed. Timber batons extend on the gable sides while the longer edges support cantilevered timber planks to further highlight the slim roofline.

7. Several tests were made to work out the best color, texture and durability for external plaster. A cement base plaster with lime finish was chosen to give the handmade texture and perfect white color, as desired.

8. The rooms, overlooking the village in the valley underneath, make use of alternately arranged cupboards and shelves to accommodate space for a kitchenette and altar opposite the bed. In keeping with the local beliefs, the ceilings are painted in teal blue to represent the sky.

9. The building sits on the mountainside, hiding its technical innovations under the cloak of traditional simplicity. It deliberately remains devoid of colorful facade ornamentation in an attempt to re-establish the hierarchy of aesthetics.
Traditionally, monastery buildings that double up as cultural institutions were colorful and elaborately decorated in contrast with the village house that was pure and humble in its purpose as well as appearance.

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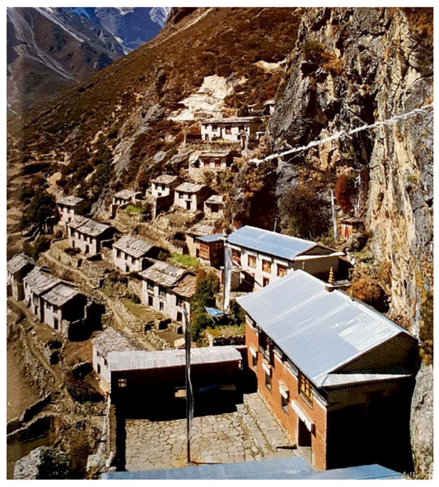
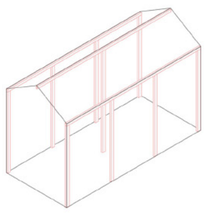
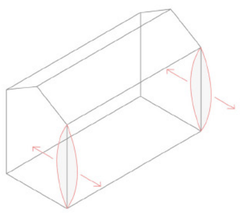
SEISMIC FAILURE AND THE DISCONTINUED VERNACULAR



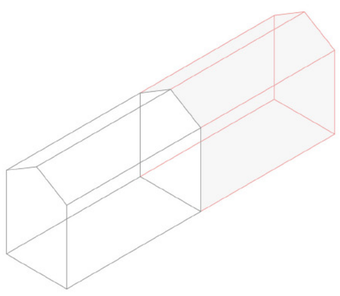
Traditionally transferred through generations of DIY construction, vernacular construction systems were slowly lost to rapid exposure to environmental, social and economic change in the remote region. Innovation was replaced by quick-fix response. The house seen here is more than 150 years old and still standing after the earthquake in 2015. This shows the forgotten resilience of Sherpa architecture. Thame Valley Re-development Project is an attempt at understanding the vernacular and contributing towards its inherent innovative, didactive and incremental nature. By reconnecting modern aesthitics with the lost past, the project strives to evoke emotional acceptance and influence replicability by nostalgia.



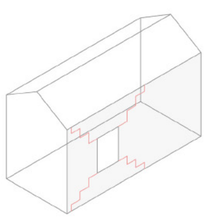
MISSING TENSILE MEMBERS



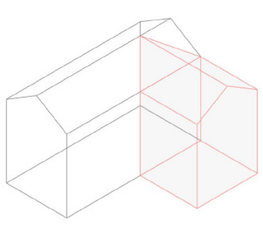
WALL DE-LAMINATION



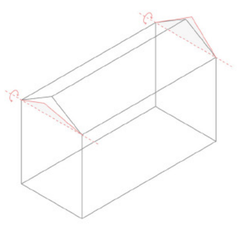
ELONGATED WALLS



MASONRY SEPARATION



ASYMMETRICAL VOLUMES



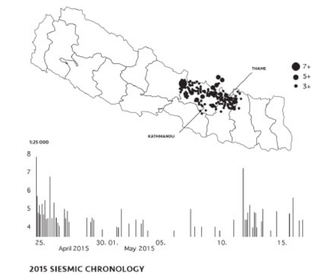
GABLE TOPPLE

These are the typical masonry failures documented in Thame valley after the earthquake in April- May 2015. The assignment for TEN was to upgrade the existing construction systems to counter these failures while achieving cultural relevance and opportunity for replicability by local residents.

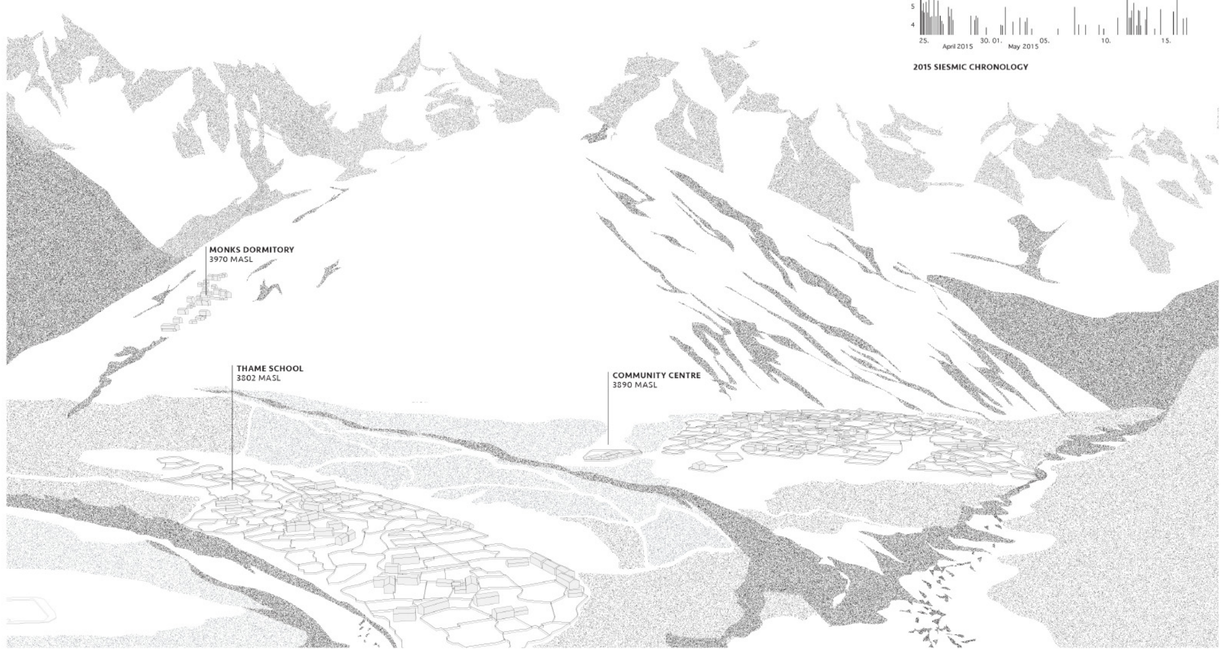
PROJECT RELEVANCE

Thame Valley, home to the Sherpas of Nepal, is located in the Khumbu Region and lies within the Sagarmatha National Park, a UNESCO World Heritage Site. In Apr-May 2015, Thame valley was afflicted by a series of earthquakes that decimated the built environment and placed the livelihood systems of local residents under duress.

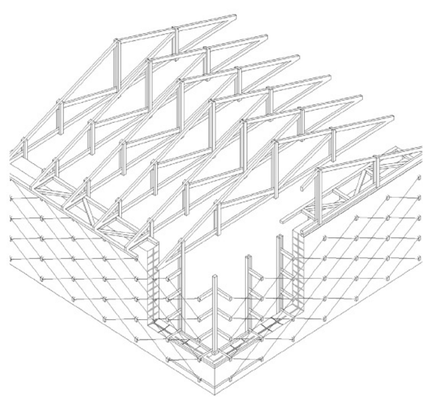
Prompted by the widespread destruction that threatened traditional Sherpa lifestyle and culture, Thame Sherpa Heritage Fund (TSHF) collaborated with TEN to analyze and develop a rural re-development strategy focusing on rebuilding community resilience through renewed construction knowledge base.

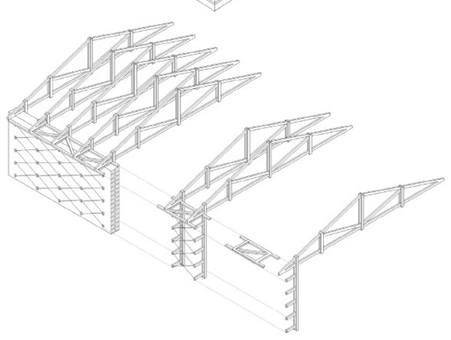


2015 SIESMIC CHRONOLOGY



The project strives for sustainability through design contextualization and strategic response. There are four key components to the same:
REPLICABILITY: Developing a typology for community buildings that can very clearly showcase upgraded designs for residential buildings.
RESOURCE OPTIMIZATION: Re-configuring the composition of local materials and skills to add structural stability without substantial increase in cost of construction
RESILIENCE: Provide practical skills and documentation that can help upgrade the construction knowledge base left unattended due to the rapid transformation experienced by the region in last 50 years.
REVISIT, RESTORE AND UPGRADE THE VERNACULAR: Come up with a regional design reference that can guide future architectural interventions with traditional aesthetics, proportions and processes in mind.

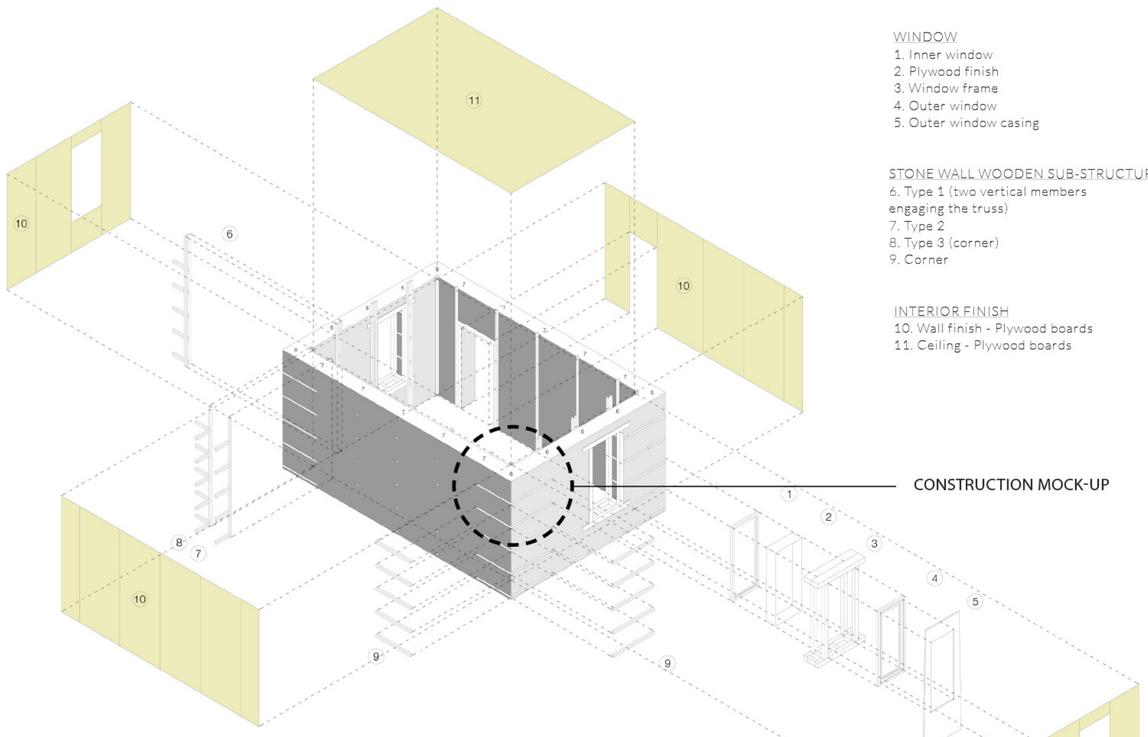




The design replaces large scale timber beams and posts now rendered unavailable in close proximity, due to the ban on felling trees inside Sagarmatha National Park, with a network of smaller pieces (easy to transport) working together to reinforce the prevalent stone masonry.

INNOVATE TO PROPAGATE.

PUBLIC BUILDING AS KNOWLEDGE REPOSITORY FOR SELF-HELP ARCHITECTURE.



WINDOW
1. Inner window
2. Plywood finish
3. Window frame
4. Outer window
5. Outer window casing

STONE WALL WOODEN SUB-STRUCTURE
6. Type 1 (two vertical members engaging the truss)
7. Type 2
8. Type 3 (corner)
9. Corner

INTERIOR FINISH
10. Wall finish - Plywood boards
11. Ceiling - Plywood boards

CONSTRUCTION MOCK-UP

A TEN organised rural workshops on seismic behavior of un-reinforced masonry with residents from 9 villages around the valley as first response in Aug 2015.

B Architects volunteered to help local masons understand the improved ways of construction for better learning and future improvisation.

C-E 1:1 scale mock-up of construction systems was built off-site to improve details where necessary and to help local masons and volunteers understand drawings by means of photos and videos.

OWNERSHIP THROUGH ENGAGEMENT

Local residents and building users were encouraged to participate and contribute towards construction of the monk's hostel. TEN and TSHF believe that best resilience is self reliance. Public projects like Monk's Hostel and School Dormitory were chosen as intervention points to make sure residents are motivated to engage with the buildings in various stages of their lifecycle.To help root the innovation booster towards construction knowledge base, local contractors were prohibited from engaging construction crew from beyond the valley.
This humble Monk's Hostel in Thame stands proud of its simplicity, hidden ingenuity and desire to influence construction beyond the building itself.