



Figure 1: Photo taken before work started to dismantle the interior of the entry hall of the building.

Architectural Restoration and Seismic Strengthening of Gönpa Gang

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Project Report, First Year – April - June 2023

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Kunjon Thakuri, Chairperson

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Introduction

This report provides and includes all information on the progress of the restoration of Gönpa Gang in the second quarter of this year. All the works carried out are described, work in progress is listed, and future works are mentioned as appropriate.

During the period from April to June our team first planned the different phases of the work planned for this year. Our first goal was to improve the existing foundations and level the ground of the site. Then we focused on the area of the entry hall with its gate as well as the southern additions of the site, which are most fragile. In preparation, the overall work planned was discussed with the entire team.

Preparation

Besides myself, the on-site architect, a site supervisor for the project was hired from Chuksang village. Further, we hired labor, stone masons and carpenters, and a cook for the on-site kitchen. Workers are accommodated on site, while I and the site supervisor stay in Chuksang village.

The site was organized in terms of accommodation, food distribution, and other rules and regulation within the construction area for the workers as well as the visitors. This included to instruct the workers about the safety measures to be taken on site.

The on-site architect and site supervisor are responsible for the work carried out at the site, including site inspection and organizing regular meetings. The meeting minutes and the decision made are conveyed to the Chairperson of Norbusum Foundation, Kunjon Thakuri. Equipment and supplies that were not available locally were supplied from Pokhara or Kathmandu. Mud and stone were brought from the area surrounding the monastery.

In first discussions with the villagers, it was decided that one person of the village visits the site every day to oversee the work. Some of these actively joined the work while others spent the time observing.

Purchase of Materials

As per the previous report we purchased wood, further tools and equipment as needed by the carpenters. We also started to search for fine mud for roofing material and purchased the necessary quantities of sand, mud, and stone. Additional items were purchased for the accommodation and food for the workers.

Community Meeting

On April 2, the team members organized the meeting with community regarding the on-going work and future plans in the village community hall. We also discussed the different problems of the site, their causes, and their potential solutions. The villagers also visited the site to observe the main issues with the foundation of the building, which were revealed once we dug along the foundation areas. In this discussion the villagers agreed to dismantle a portion of the newly constructed mani-wheel wall around the old structure, as it obstructed the planned restoration work.



Figure 2: Meeting organized at community hall and describe about site by our team members.



Figure 3: Villagers looking at existing foundation's condition after a dig around the outer wall.



Figure 4: Villagers observing the assembly hall area's post plague caused by roots of the trees surrounding the building.

Restoration Works

During the preliminary dismantling the structure – including the southern part of the building roof work were dismantled to renovate the joist and wooden elements. The team also inspected the surrounding of site. Taking into consideration the dampness of the foundation, twisted wooden elements of front gate, layers of flooring, weak foundation and bulged stonewall, the following action were carried out.

Entry Hall

It was decided to first restore the Entry Hall of the monument, as it is a relatively confined space and major repairs needed to be done there. Its balcony was restored multiple times and it is hard to tell how it looked originally. The reconstruction of this area follows that proposed by John Harrison. The full dismantling of the wooden structure in the Entry Halls interior was needed to be able to replace the foundations of the pillars and level the construction again.

The superstructure of the Entry Hall was dismantled from the roof to the base of ground floor, including the entire wooden structure. Only the walls of the hall were retained. Then all wooden elements were renovated, cleaned, leveled, and prepared for reconstruction, whereby rotten wooden elements were replaced with new ones. To hold the new structure new bed stones were laid in the appropriate size, that is much larger than the original ones and joints prepared by stone masons. The wooden structure was then gradually restored as documented in the images below. By the end of the quarter, the first-floor level was finished including the mud, while the roof was still outstanding. Work on the reconstruction has continued since.



Figure 5: Dismantling of the porch area started from roof.



Figure 6: Then the entire often restored and poorly constructed balcony was dismantled.



Figure 7: then the lower part of the porch was dismantled as well.



Figure 8: Once the entire interior structure was dismantled, the wall paintings were protected with tarpaulin.



Figure 9: View of the entry hall wall with severely damaged murals during dismantling of the upper floor.



Figure 10: Parts of the original pillars and capitals laid out after dismantling.



Figure 11: The original beam holding the porch was lengthened by adding a new bottom section.



Figure 12: The support for the beam in the wall was strengthened by adding a level wall plate.



Figure 13: All original wooden members were cleaned and prepared for reconstruction, as demonstrated by Thomas Schrom here.



Figure 14: Cleaning of original wooden members.



Figure 15: The old pillar with extension is placed on the new bedrock for reconstruction.



Figure 16: New joints were prepared for the parts of the capital as well.



Figure 17: Here the laying of the beam is prepared by first placing the boards lying underneath it.



Figure 18: The original beams being placed on top of the pillars.



Figure 19: Placing the beam on the new support inside the wall.



Figure 20: The joists are being refitted into the existing openings not to harm the wall paintings.



Figure 21: Preparing the decorated wooden parts for the front gate.

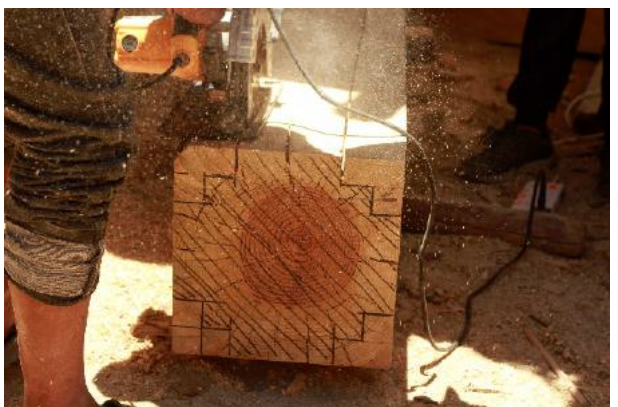


Figure 22: The massive pillars of the porch needed to be replaced. Here the new pillar's shape is prepared.

The front porch has been restored after the reporting period.

Strengthening the Foundation

When excavating along the wall, it turned out that the foundation of the building was weak. It thus needed to be strengthened throughout to ensure its long-term stability and safety of the structure.

After analyzing the current condition of the foundation and identifying potential risks (damages and distress) weaknesses, we concluded that it is necessary to build a continuous stone wall adjacent to existing foundation to increase its load-bearing capacity. In addition, the wall was covered with a thick layer of mud to maintain its slope toward drainage dug along the building.



Figure 23: Digging along the outer walls to foundation level.



Figure 24: The most precarious parts of the foundation in the northwestern corner of the building.



Figure 25: Constructing a stonewall along the building to consolidate its foundation.



Figure 26: Finishing the new stone wall at a corner.



Figure 27: Final mud layer on top of the newly constructed stone wall.

Southwest Room

The southern structure added to the temple at a later period was in a precarious condition. Only one of the rooms in this part painted, allowing for the replacement of the other structures as needed. Again, the wooden structure is taken down and rebuilt, while the walls are retained.

Forth the room in the southwest corner of the building was demolished and rebuilt on a stronger foundation. After demolishing we prepare the foundation, a large bed stone with a joint for the post to be placed on it. The old construction being of extremely poor quality, new post, capitals, and beams were prepared and installed at ground floor level. Of the joists some could be retained while others needed to be replaced. Then, a new flooring with minimum thickness of mud was constructed and some of the wooden members could be retained for the upper floor. Wall plates and a wall tie was installed on the upper level for seismic structure strengthening.



Figure 28: Dismantling the interior of the old structure in the southwest corner of the building.



Figure 29: Foundation stone, pillars and beam prepared for reconstruction.



Figure 30: Placing the beam on new wall support.



Figure 31: Placing the joists, some salvaged some new.



Figure 32: Assembling an old capital on top of a new beam on the top floor, note that their connection is reinforced.



Figure 33: Placing the joists on the top floor.



Figure 34: Leveling the top of the wall to enable the installation of a wall tie for seismic strengthening.



Figure 35: Installing the wall tie on that wall.

Southeast Corner

Due to an increasing bulge in the stonewall at the southeast corner, our team concluded to reconstruct the stonewall. The issue was observed during the daily site inspection. In this case the wall tie could be added in the middle of the stone wall and also serves as the support for the joists on the ground floor. The stonewall work was carried out using mud mortar.



Figure 36: The structure in the southwest corner before dismantling the corner area of it (2019).



Figure 37: Adding supports in the interior before dismantling the south-eastern corner.

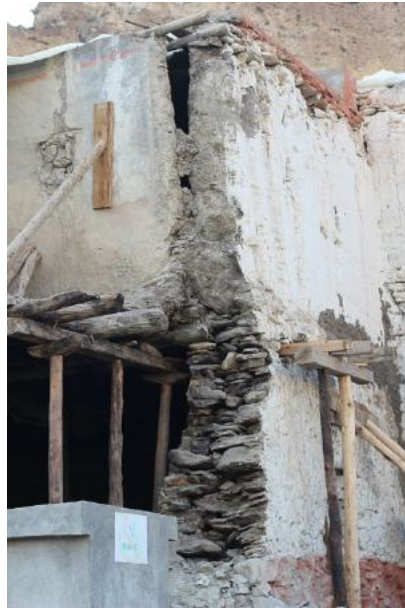


Figure 38: Gradual dismantling of the southeast corner area



Figure 39: The corner fully dismantled and temporary supports added.



Figure 40: Preparing the foundation for the new corner wall.



Figure 41: Constructing the wall with mud mortar.



Figure 42: The wooden wall tie for seismic strengthening.



Figure 43: Installation of the wall tie for seismic strengthening.



Figure 44: The construction of the wall close to reaching the ceiling of the ground floor.



Figure 45: The finished ground floor wall as seen from the corner.

Repairing Wall Plaster

All areas of the walls in the entry hall and around the monastic building that were not covered with mud were repaired. The mud was mixed in the traditional way for this task. Stone walls revealed by the loss of mud plaster were repaired and covered.



Figure 46: Repairing the areas of wall where the stones are revealed.



Figure 47: Repairing sections of the outer wall.

Figure 48: A patched up section at the back of the temple.

Figure 49: Mud plaster applied to the lower parts of the entry hall.

Drainage

The temples main problem are the result of moisture and dampness affecting both the outer walls as well as painting walls inside. Considering this, our team concluded to establish the proper drainage for the site. The drainage was designed in such a way that even rainy season water could not collect and cause dampness in future. The drainage system was established at a distance from the wall and its foundation, the latter built with a slope leading away from the building.



Figure 50: Digging a drainage at a distance to the temples walls.

Status of Works

The following table provides estimates of the work done so far in relation to the overall work necessary.

Activity and output table for second quarter of Gonpa Gang project		
Activity	Output	Status
Mobilization	Update work plan and schedule	90%
On Site structural investigation and restoration measures	Revised the plans and structure details as per site	55%
Construction work	Construction work will continue up to mid of October	40%
Construction supervision	Till to end of construction work	40%

Challenges and Successes

Our team started with site clearance and the dismantling from the roof. The team has been able to acquire both skilled and unskilled labor. During the dismantling of the roof, the windy conditions at the site for much of the day turned out to be challenging. Therefore, the whole dismantling process needed to be carried out with extra safety measures in place.

Mid-April there was heavy snowfall that affected work at the site for two to three days.

During the restoration work, many of the wooden elements could be restored and reused. Horizontal wall ties were not used originally, but were added when possible, to add to the strengthening of the structure in case seismic activity.

Due to the wall paintings, the joists in the entry hall had to be placed in their original position without harming the murals. This was particularly challenging as special care had to be taken during the removal and replacement of the joists.

At the beginning of the work, we faced problems with the available drinking water, with several workers getting sick. Accordingly, we had to take two days to channel clean drinking water from the small river near the site to the temple area.

Transporting material from Chuksang village once vehicle access was not possible anymore represents another challenge, especially for larger amounts or more heavy material. However, most required materials were brought on site before and overall, we managed to get whatever we needed and proceed with the work smoothly.



Figure 51: The entry hall with its murals covered with tarpoline to prevent damage from rain and snowfall.

Painting Conservator

Since the painting conservator Sreekumar Menon was brought to Mustang for the Lo Gekhar and the beginning of the work there was delayed in early April, Sreekumar was asked to assess the conservation needs of the site and also secure fragile paint layers before restoration.

A separate report formulated by Sreekumar is provided separately.

Accounting

By Lopsang Dorje Lama

As of Year 1 Quarter 3, our cumulative expenditure stands at **\$ 65,385.71**, which represents approximately 41% of the year 1's approved budget of **160,551.68**. Consequently, we are at budget surplus of 59%, while on timeline, we only have a quarter (25%) left in first year.

We had requested and received **\$60,901.87** as first installment for the project. We have cash left in bank but it's not enough to meet all the unliquidated obligation of **\$16,962.95** at the end of this quarter. A Request for 2nd installment shall be done shortly.

In the previous quarter, our total expenditure amounted to **\$32,172.93**. This encompassed costs associated with procurements of tools, materials, food and accommodation supplies. All the major materials that were required on site had to be procured and restored in last quarter because there is no safe route to transport goods during monsoon. The current quarter witnessed an acceleration of project operations, resulting in a total expenditure of **\$ 22,468.44**. There have been some material procurements in the earlier period of this quarter as well.

Regarding expenditure categories, significant surpluses have emerged across various categories: Contractual (64%), Travel and Accommodation (63%), Personnel (58%), and Supplies (56%).

The Contractual surplus arises from uncharged permit-related expenses for the conservation architect's visit to Mustang in the Gonpa Gang project, along with unspent budget for audit fees which is expected to be spent in following quarter.

The Travel category benefitted from the local appointment of Santosh Gurung as an On-site Manager, negating the need for special transportation and Food & accommodations. Prudent management of experts' travel, accommodation, and meals contributed to further underspending in this category.

In the Personnel Category, the surplus is attributed to dual sourcing of the Accountant's Salary from Logekar and Gonpa Gang projects, as well as the late hiring of the Program Officer/On-site Architect, Sabin Shrestha, in the second quarter.

As for Supplies Category, we neither forecasted nor made any expenditure on the line items: "Stone slate". There is very limited space for safe storage of materials so lot of materials procurement are postponed for next year, the decision has been made on the basis of requirement of materials on timeline. There's no point to store materials that is not required until the later stages of the project.

Over expenditures have been observed in two line items under the Supplies category: 13% in building tools and 25% in beams.

We are really short on the line items "Transport of Materials" under the category "Contractual". On top of that, beginning from new fiscal year 80/81, a new rule has been imposed by government which increases the cost of transport of goods: we have to pay VAT on transport/carriage services regardless of whether the service provider is registered in VAT or not. Similarly, we are very tight on the line item "Organizer's Travel" which accounts for transportation, food and accommodation of the team members on project.

In summary, our financial highlights both positive and challenging aspects of our budget management and expenditure distribution. Prudent adjustments and considerations will be key as we navigate the remaining stages of the project.

Evaluation

Overall, the work at Gönpa Gang goes well. In terms of management, Sabin Shrestha and Santosh Gurung are competent leaders for the work on site. Certain works planned were considerably delayed as skilled carpenters could not be found for a considerably period in the middle of this quarter.

The windy conditions at the site are not only an issue during work, but also for covering larger construction areas for elongated periods. Overall, the time gap between the dismantling of the structures and their reconstruction was long and represented a risk. This is particularly true for the entry hall, the walls of which are covered by wall paintings. The sever winds also increased the separation between the front wall of the entry hall and its northern wall, with the crack there increasing considerably over time, an issue to be dealt with in the current quarter.

Sreekumar's presence at the site was extremely valuable and his familiarity of the site will make next year's work easier to plan and complete.

Going Forward

This quarter will be spent with the repair and reconstruction of the floors and roofs. Likewise, drainage work and laying stone slates to consolidate it will continue. The repair and newly construction work of southern part of Gönpa will continue. Further, a portion of the roof of the Assembly Hall (Dukhang) may be dismantled and restored, but the plans in this regard are under discussion.