

**DHE-TSANG MONASTERY:
PROTECTOR TEMPLE ARCHITECTURAL REPORT
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**KHAM AID FOUNDATION
ART AND ARCHITECTURAL CONSERVATION PROGRAM**

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INTRODUCTION

General Building Description



*Southeast corner of Protector Temple,
flanked by new kitchen building to south*

The Protector Temple is one of the oldest extant structures at Dhe-Tsang Monastery, located in the Gyarong region on the Eastern Tibetan Plateau, in what is today northwestern Sichuan Province, People's Republic of China. Both the materials and design of the structure are representative of the local Gyarong building traditions, which differ considerably from many of the building traditions of the surrounding areas. In the neighbouring region of Kham, also within modern-day Sichuan, buildings are typically composed of battered rammed earth walls and flat earthen roofs, but Gyarong-style structures consist of stone masonry walls and low-pitched gable roofs.

The Protector Temple is a three-story structure, with an attic, constructed of load-bearing rubble granite walls. The attic is partially exposed by the broken gable peak, and the roof above is clad with irregularly sized slate shingles. There is no basement and the interior has wood post and beam construction. A new portico is located at the building front and was constructed in the late 1990's.

Site Description

Dhe-Tsang Monastery occupies a large area on the southern slope of a hill approximately 3600 metres (12,000 feet) in elevation. The site is strategically located to receive the maximum amount of sun exposure as well as protection from the northern winds. Over 60 buildings populate the site, and consist of temples, monks' quarters, residences, and a large kitchen; outside the monastery gates are a guesthouse, general store, and a few residences. An open courtyard is situated in the southern area of the site, not far from the monastery gates. This plaza is the religious and social center of the monastery, where monks attend prayers several times a day, and are seen frequently congregating before and after meals. The Protector Temple and kitchen / dining building border the west side, and the contemporary main temple, which is used for all general prayers and activities, is located on the north side. A new building under construction borders the east edge, and steps descend from the south towards the monastery gates.



Dhe-Tsang Monastery seen from the south

Site History

According to official monastic history, Dhe-Tsang monastery was established in 1414 C.E. by Ngawang Drakpa, a disciple of the famed Tsongkhapa, founder of the predominate Gelug sect of Tibetan lamaism. Ngawang Drakpa is thought to have established a total of 108 religious institutions, of which “Dhe-Tsang”, meaning “completion”, would be the last of the series. While evidence exists at the monastery to support at least the purported period of founding, further research is required to uncover substantial evidence regarding the life and accomplishments of its founder.

The lamasery was purportedly founded with a total of eight original structures, of which two are still extant: the Protector Temple and the Founder’s house. Both of these buildings are imbued with incredible significance in the eyes of the monastic community, given their direct relationship to the founder of the lamasery and their historical significance within the life of the monastery.



Painting of the monastery done by a monk from Dhe-Tsang, 1957

Over the centuries, the monastery grew to house some 800 monks at its height, highlighting its role as a center of asceticism for the initiated rather than as a prominent pilgrimage site for the layperson. The site’s solitary location, nestled amongst the hills, reinforced this aspect and, still today, assures the peace and solitude of the lamasery and safeguards the ability of resident monks to focus their efforts on religious scripture.

Historically, monks were permitted, if not actively encouraged, to build houses within the complex, thus expanding the physical size of the monastery and increasing the number of structures at the site. As the number of ascetics at the monastery grew, so also did the monastery’s need and ability to construct more religious structures. Today, it is many of the extant monks’ quarters at the site that demand the most attention, both in terms of significance and state of preservation.

ARCHITECTURAL DESCRIPTION

Stylistic Characteristics - Gyarong Region

The buildings in the Gyarong region of Sichuan Province share material and stylistic characteristics. Stone masonry walls, slate-clad gable roofs, and wood post-and-beam construction are the common elements of both religious and secular / domestic buildings. Residences are usually sited facing south, to maximize sun exposure.



Typical Gyarong-style building, south facade

Temples are also built facing south, in accordance with Buddhist religious tradition and, presumably, architectural practice. Few windows are located on the north wall, to protect against the northerly winds and also in accordance with residence building, where few windows were included as protection against bandits. Residences are frequently built in an 'L' or 'C' shaped plan, and face onto a courtyard. A stone wall often encloses the courtyard and protects the house, harking back to times of banditry and kingdom/clan rivalry.

The stone masonry construction is typically rubble granite, laid in a particular bond pattern and coursing. A frequently seen pattern involves alternating courses of larger stones with smaller / flatter stones; another pattern is made up of a number of small stones stacked between the voids of large stone units. Almost ubiquitous are the upturned courses of building corners. Due neither to settlement nor subsidence, the termination of courses on an upward bend is a stylistic trait of the architecture of the region, the history and significance of which requires further investigation.

The roof is a distinctive feature of the Gyarong architecture. It is composed of a low-pitched structure, often in gable form, with slate cladding, and is partially open, allowing for ventilation to the attic area. The attic, with a flat earthen floor, is used to dry and store grain, vegetables, and even laundry, thus requiring ventilation and sun exposure. The latter is made possible by the inclusion of a small area, completely unprotected by the roof structure and, thus, vulnerable to the elements. Furthermore, although the slate roofing is frequently checked and readjusted as necessary over the rest of the roof, the flat earthen surface below is often vulnerable to wind-blown precipitation, which can accumulate (puddle) in areas and saturate the surface, eventually infiltrating the building fabric.



Open area of roof in typical Gyarong-style house

History of Protector Temple

Attributed with a founding date of c.1414, the Protector Temple began as a one-room structure, two stories tall, that grew outwards and upwards, gaining three rooms to the east, south, and west, and an additional floor above. The original building is what is now the Mahakala (Tib. mGon-po) room, the most sacred chamber in the entire monastery. Named after the deity to whom it is devoted, an important protector of the Buddhist faith in Tibet, Mahakala, the entrance opening is cloaked with a heavy curtain, behind which are locked doors. So sacred is the space that only certain members of the monastic community are allowed to enter and tend to the statues within. Today, the main temple space is to the south of the Mahakala room, and two storage rooms flank either side of the original Mahakala temple. A number of features distinguish the later construction from the original, particularly the wall construction method, heights of flooring, and the design and condition of the door jamb for the entrance into the Mahakala shrine.



Exterior north wall of Mahakala room, with larger addition in the background

Viewed from the exterior north wall, the Mahakala room protrudes out by over 4 meters from the wall plane of the addition. At the inside corners, it is apparent that the later masonry construction is not stitched into the previously existing stone coursing. Another difference is the bond pattern; the older walls have alternating courses of larger stones with smaller stones. The adjoining walls feature similarly sized courses, with stacks of small stones in between the larger units. In addition, the Mahakala room walls have reinforcing timber members, which are noticeably absent from the later construction.

Viewed from the interior, a higher floor level in the Mahakala room serves to further distinguish it from the surrounding addition. Located almost 70 cm above the main temple room floor, it is an awkward step up into the sacred room. The adjacent room door openings are both on plane with the floor level of the much larger, main room. Unfinished plaster on the wall surface below the door sill outside the Mahakala room suggests the removal of an element, such as a stoop with several steps.

Furthermore, the entrance to the Mahakala room is from the south, in accordance with traditions of Tibetan religious architecture. This is in contrast to the modern entrance to the Protector Temple from the east, which begs explanation. It seems that the new entrance and orientation were due to the addition to the original structure, which also addressed the need to open onto what, presumably, had become the central courtyard of the monastery since its establishment (and that of the Mahakala shrine) in the early 15th c.

A striking feature of the Mahakala room entrance is the monumental door jamb, constructed of wood and painted in vivid colors. The elaborate design and level of detail lend the door opening the appearance of a main entrance. In addition, the door jamb is very worn and eroded, displaying the age of a material substantially older than adjacent door jambs. Lastly, the walls of the Mahakala room appear to be load-bearing, with the exterior face sloping outwards, even on the walls that are

now interior partition walls, that face onto the main temple room. However, these previously exterior walls have been plastered, and subsequently painted with murals.

Two bulbous finials were discovered at the attic level, underneath several feet of stored twigs. The remaining finials may still exist but cannot currently be located due to the dense floor covering. The locations of the finials correspond to the corners of the Mahakala room below.

Once in the room, the extant wall paintings, dissimilar in style from those in the main hall, suggest that this part of the building predates the rest of the structure. The style and treatment of the figures and their costume is reminiscent of early central and even western Tibetan paintings and might easily be compared to work found in monasteries such as Shalu and Ntho-ling.



Images from the interior west wall of the Mahakala room. The style and treatment of the subjects are reminiscent to central and western Tibetan painting styles and quite distinct from the painting found in the main hall of the Protector Temple and elsewhere at the monastery.

In 2000, a new portico was added to the main entrance of the building (east façade) to replace the earlier, presumably original portico. This earlier portico was torn down due to its condition, which apparently endangered the structure of the building. The seam between the main hall (i.e. the first known addition to the Mahakala room) and the new portico is visible at both the north and south walls, where a break in the masonry is apparent for the entire height of the structure.



Exterior north wall of Protector Temple, with clear separation between earlier structure and new portico.

PROTECTOR TEMPLE: CONDITIONS ASSESSMENT

Site

The Protector Temple is located on the west side of the courtyard and in the southern region of the monastery. Located on a sloping site, water run-off from higher ground drains south, and the north wall of the building is particularly susceptible to high moisture levels, because of the absence of a storm / trench drain. Simple drainage to the east of the building, thus in front of the main entrance, appears to be functional. However, given its location, it does



South exterior wall of the Protector Temple with extensive plant growth at the base, evidence of excess moisture in the building fabric. The roof of the nearby kitchen (note shadow) and the roof of the Protector Temple shed large amounts of water into this narrow alley during downpours. Lack of adequate drainage results in moisture creeping up the walls of the building through capillary rise.



Drainage running in front of the Protector Temple consists of a trench covered with slate. While this does lead water away from the east side of the building, it does not catch the water running into the north wall.

not catch and lead away the water from the north of the building, where water from the north runs into the base of the structure. Adequate drainage is also required at the south wall, where there is insufficient clearance between the temple and the neighbouring kitchen. In addition, the kitchen roof overhang directs water to the south wall of the temple, and has led to widespread mortar loss and substantial biological growth, i.e. mosses, lichens, and other vegetation.

Structural

The structure of the building is a combination of load-bearing masonry walls, with timber columns and beams. A timber frame also reinforces the original walls of the Mahakala room, presumably as an additional measure for resistance to seismic activity, an important consideration in the region. On the first floor, the columns and beams are embellished with carvings and vibrant paint colours. They appear original to the building, while a number of columns and beams



View of interior south wall and painted column and crossbeams.

on the second and third floors have been replaced, probably due to water damage, evident throughout the ceiling joists. These structural members on the upper floors are neither carved nor painted.

The building shows structural deficiencies, in terms of both design and material failure. Due to the incremental growth of the temple, it is assumed that construction campaigns were not co-ordinated, resulting in unsuitably located columns, beams, and wall openings.

A number of beams are located over window or door openings, thereby putting an increased load on lintels. Along the east wall, two beams are located on both ends of the entrance door lintel, resulting in two cracks above the lintel, at the right end and left of center. The right crack is substantial, opening up to approximately 1 cm at its widest point. This same structural problem is seen next to the entrance door, above the window opening. A beam terminates over the window lintel, which has caused the lintel to sag due to the excess load. The excess load has caused a shear fracture in the wall, with a crack extending from the beam pocket to the lintel (left end), which continues to the floor from the left edge of the sill. Another crack emanates from the right end of the lintel, due to the relative upwards movement from the load of the beam, which is slightly left of center. This crack steps upward and to the right, toward the ceiling and south wall.

A separate structural deficiency is the differential movement, both vertical and horizontal, that is occurring in the structure. It is unclear whether the vertical movement is a result of settlement, ground subsidence, overloading, or a combination of factors. Evidence of this vertical movement is seen in the noticeable grade changes at the ground floor surface level, and by the sloping beams above the columns. This in turn creates differential horizontal movement, evidenced by beams pulled out of walls, and walls that are out of plumb. Walls begin to lean and buckle when the lateral stability of a building is compromised by weakened structural connections.

In general, it appears that the greatest vertical movement is in the columns at the center of the structure, where the beams above the columns slope the most. In addition, sections of the masonry walls appear to be subsiding, most noticeably at either end of the south wall.

The south wall is the most problematic of all the elevations, because of the combination of forces at work. The floor slopes down to the southeast corner, and the wall is 15 cm out of plumb, leaning into the building. This suggests settlement or ground subsistence. In addition, the wall shows a substantial bulge below the window, with numerous and extensive cracks within the depth of the window opening. This deterioration suggests overloading, evidenced by the fact that a beam terminates over the right end of the window lintel. The beam over the window lintel is not level, and the upward slope toward the wall could be a result of the sinking central columns, causing a relative upward motion of the beam, or of the subsidence of the south wall masonry. Compounding this vertical movement is a twisting movement, seen at the beam pocket, where a large gap has opened up at the left side, and where the resulting pressure from the beam has cracked individual stones, to the right of the beam.

Building Envelope

The building envelope is not watertight, with numerous breaches in the walls, windows, and roofs, all allowing for the infiltration of moisture into the building fabric. Signs of moisture entry can be seen on every floor throughout the building. The adequate protection of the building fabric against



Moisture infiltration at the SE corner of the upper floor of the new portico



Inadequate coverage of slate results in water infiltration soaking the roof frame and the fabric beneath it. This leak showed repercussion through the building down to the ground floor.

this moisture is integral to the long-term preservation of the building and need be incorporated into any maintenance work.

Exterior Walls

The rubble stone walls vary in thickness from about 90cm to 1.3m in thickness at the ground floor and taper to a width of approximately 40cm to 80 cm on the third floor. Despite the mass of the masonry volume, material failure is noted in the numerous through-stone cracks on all elevations. Although the rubble masonry construction does not lend itself easily to the identification of cracks, full-height step cracks and open joints were noted on the south and west elevations. Some of the cracks correspond to the interior wall plaster cracks.



Exterior west façade of Protector Temple with replacement windows that are paneless and unglazed. The lean of the south wall is visible from this perspective.

Windows

The windows are constructed of unfinished wood and those on the upper floors are not glazed. Rain, snow, and other precipitation enter the building through faulty and/or paneless windows, causing deterioration of the wall plaster surfaces below the unglazed openings. A number of windows have been replaced, attesting to the failure of earlier models. Further mechanical damage is often evident at the openings where new windows of been installed, including the plastering over of wall paintings and poor masonry touch-up work.

Roofs

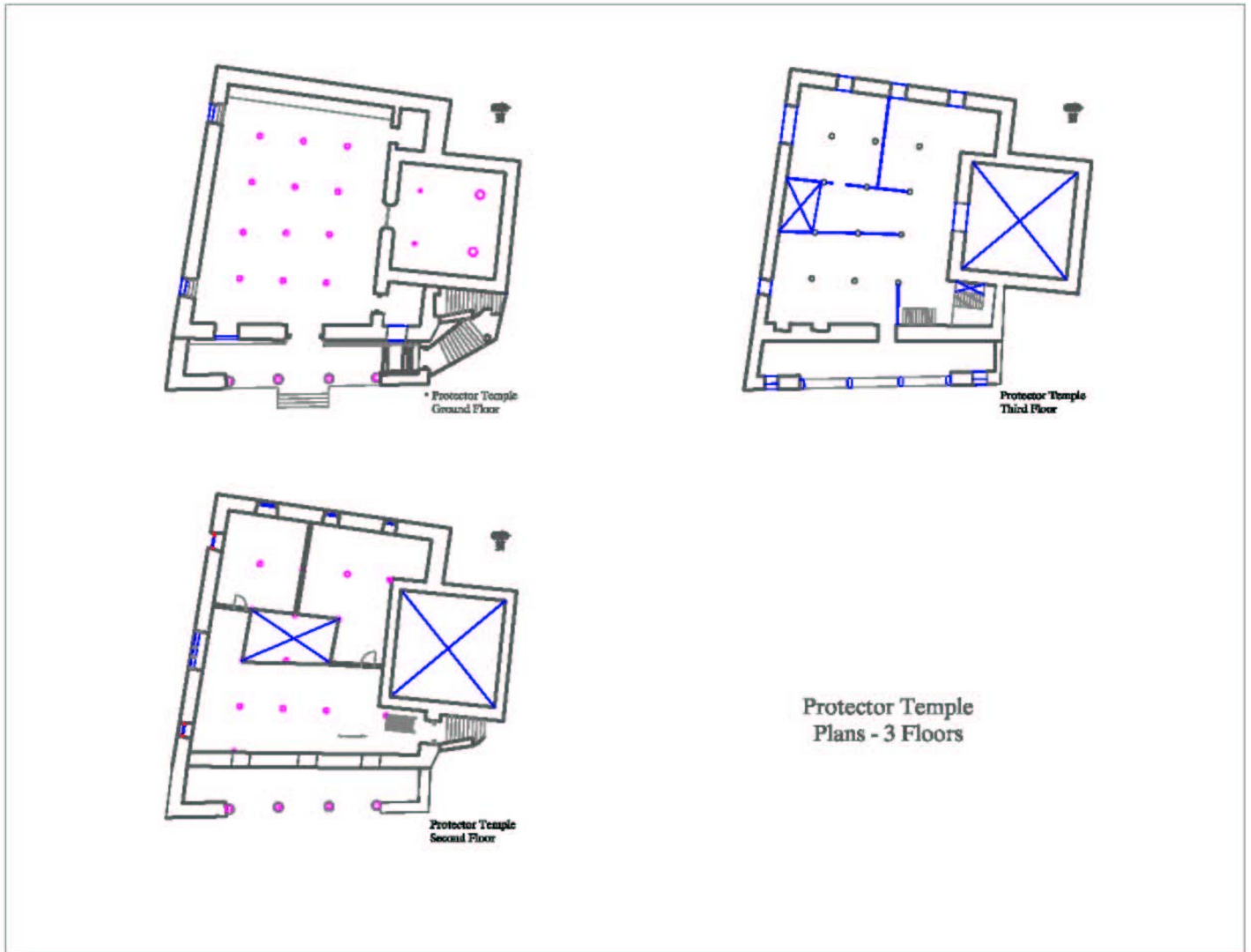
The roof undergoes routine maintenance to ensure the secure and proper placement of the slate. Nonetheless, frequent failure of the roof to adequately shed all precipitation is frequently seen during episodes of rain. Given that the attic flooring is itself incapable of shedding water, moisture easily makes its way into the fabric of the building. It should be noted that grain and other materials stored in the attic space themselves absorb the water and, during particularly heavy downpours, can become soaked substantially adding to the load of the roof, perhaps even contributing to the signs of overloading noticed in the structure.



Repositioning of slate during rainstorm

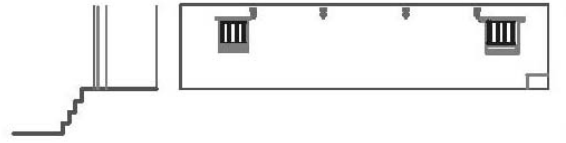
Appendix

Architectural Drawings: Plans

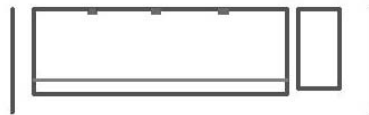


Architectural Drawings: Interior Elevations

Protector Temple Interior Elevations



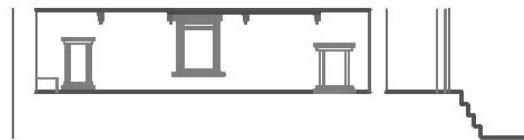
Protector Temple
Ground floor - South interior elevation



Protector Temple
Ground floor - West interior elevation



Protector Temple
Ground floor - East interior elevation



Protector Temple
Ground floor - North interior elevation