



THE PATAN ROYAL PALACE RESTORATION AND CONSERVATION PROJECT

JOINT MISSION REPORT

DECEMBER, 2006

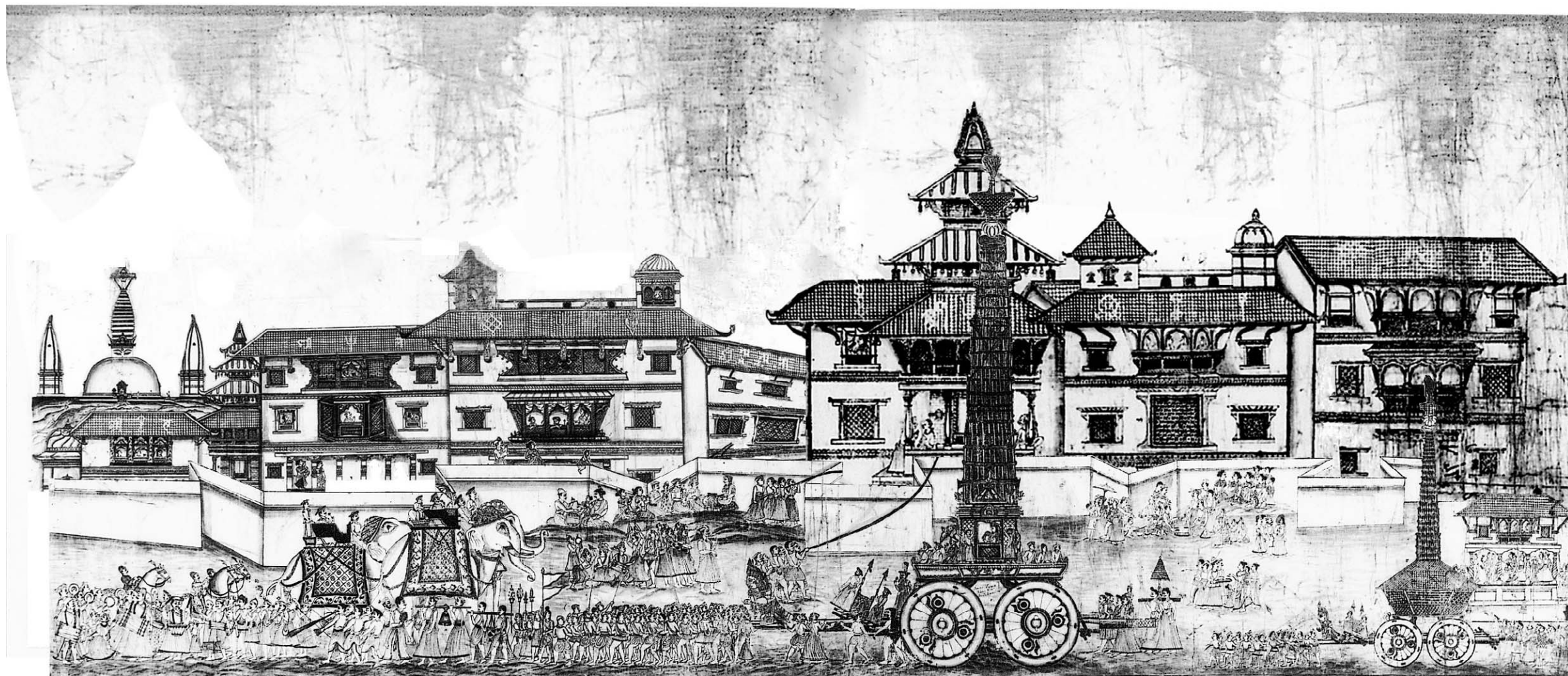
cover:

Patan Darbar Square from the south

The caption reads "General Juggut Shumshere
can be seen in the foreground."

Photograph by Clarence Comyn Taylor, ca. 1863

Royal Geographical Society, S0003074



THE PATAN ROYAL PALACE RESTORATION AND CONSERVATION PROJECT

JOINT MISSION (MAY 1-6, 2006)

OF THE

KATHMANDU VALLEY PRESERVATION TRUST (USA)

AND

THE UNESCO WORLD HERITAGE CENTRE

IN COLLABORATION WITH

THE DEPARTMENT OF ARCHAEOLOGY, MINISTRY OF CULTURE, TOURISM AND CIVIL AVIATION,
GOVERNMENT OF NEPAL

JOINT MISSION REPORT

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A fanciful rendering of an urban scene

The chariots of Macchendranath and Minnnath are seen in the foreground, the stupa of Svayambhunath on the far left.

Attributed to Rajman Singh, ca. 1840

Musée Guimet, Paris

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Aerial view of Patan Darbar Square and the Patan Royal Complex, 2006

PREAMBLE

In November 2004 the Kathmandu Valley Preservation Trust (KVPT) prepared an application to the World Monuments Watch to include the Patan Royal Palace Complex in its 2005 list of the world's most important *and* threatened monuments. The Patan Complex was selected from a number of proposed projects under development by the Trust for several reasons. First, as confirmed by its inclusion on the UNESCO World Heritage List and on the World Monuments Watch List, the site was indeed one of the principal monuments of Nepal and was threatened after decades of neglect and deterioration. Second was a response to the Department of Archaeology's request. Third, the Trust had long been focused on the square based on research of Professor Eduard Sekler and Michael F. Doyle of 1982. Numerous repair and restoration projects focused on the palace, which for many years was not considered for interventions based on assumptions that the UNESCO Japanese Trust Fund would cover the costs for restoration.

When the World Monuments Watch listing was announced, a fundraising trip by KVPT for the project was planned for November 2005 to demonstrate to donors the importance of the site and scale of the project. At the same time a grant from the Robert W. Wilson Challenge to Conserve Our Heritage announced \$400,000 in potential matching funds for the project. With this seed money, additional plans were laid out including this mission.

The purpose of the mission was to bring key consultants together for a week of intensive field work and planning which would allow the scope of the project to be outlined. This overview of the project would list project goals, activities, conservation challenges, and obstacles. Preliminary cost estimates would be developed. Most importantly, the mission would review preliminary survey work, documentation and research prepared by Niels Gutschow and his team November-April 2006.

It should be mentioned that this palace complex has perhaps been studied by more than any set of structures in the country. Unfortunately, very little repair work (with the exception of Keshav Narayan Cok, the northernmost courtyard) came out of these efforts. This said, it remains an important goal of the mission to identify, review and collate all materials about the palace so that the present study will not repeat efforts but build on the work of previous teams. A comprehensive annotated chronology of past research and reports in connection with the complex is included as an appendix.



View of the Patan Darbar Square from the southwest

Photograph Kurt Boeck, 1899

Museum für Völkerkunde, Vienna

MISSION PARTICIPANTS

Giorgio Gianighian, University of Venice, liaison to UNESCO World Heritage Centre

Prof. Niels Gutschow, South Asia Institute, University of Heidelberg

Bhim Nepal, Director, Patan Museum, Department of Archaeology

Gregory Oliveri, Preservation Architect, KVPT

Dr. Rohit Ranjitkar, Nepal Program Director KVPT

Thomas Schrom, Project Consultant, Patan Museum

Erich Theophile, Executive Director, KVPT

Prof. Emeritus Eduard F. Sekler, Graduate School of Design, Harvard University, Senior Advisor to the Mission

The mission participants consulted with the following individuals whose respective expertise enriched and informed the Mission findings:

Dr. Kosh Acharya, Director General, Department of Archaeology

Dr. Saphalya Amatya, Conservation Specialist, former Director General of the Department of Archeology

Claire Burkert, Craft Specialist

Kanak Mani Dixit, Himal Magazine

Prof. Götz Hagmüller, Architect

Prayag Raj Joshi, Engineer, Lalitpur Heritage, GTZ - German Technical Cooperation

Saraswati Joshi, Monument Maintenance Office, Department of Archaeology

Ms. Koto Kanno, UNESCO Representative to Nepal

Pratima Pande, Nepal Heritage Society

Sagar S.J.B. Rana, Lalitpur Heritage Society

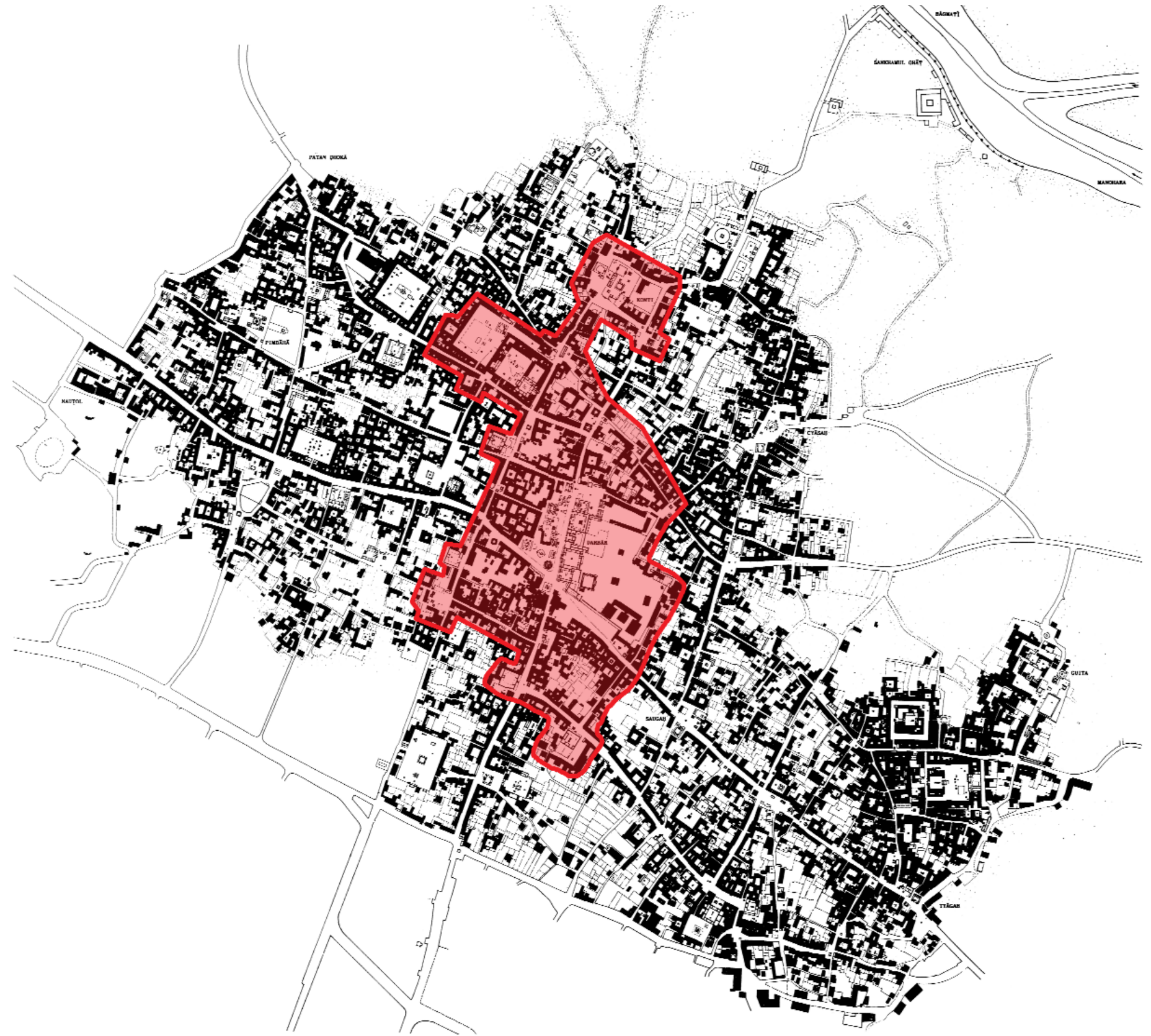
Purna Man Sakya, Reliance Law, liaison to Young Men's Buddhist Association (YMBA)

Nutan Sharma, Indologist

Hari Raj Shrestha, Headmaster, Adarsha Secondary School

Dr. Gautam Vajracharya, Indologist, University of Wisconsin

Kai Weise, Architect



Map of the historic core of Patan
The Patan Monument Zone is indicated in red.
Prepared by Niels Gutschow, 1992

MISSION SCOPE AND OVERVIEW

Initiated by the Kathmandu Valley Preservation Trust, the joint Mission to the Patan Royal Palace Complex convened from May 1st through May 6th, 2006 to investigate a multi-phase Conservation and Management Plan for the restoration and adaptive reuse of the Complex. The goal of the Mission was to gain an understanding of the extent, complexity and scale of the project in order to map a course for future planning, research, and fundraising.

Mission participants took part in a series of intensive site inspections at Mul Cok, Sundari Cok, Nasal Cok, the Bhandarkhal Garden, Bahadur Shah's North Wing, and the Court Building. Visits were followed by workshop discussions that focused on specific topics related to conservation and adaptive reuse. Points of discussion included the adaptive reuse of the Palace Complex as the site for an expanded Patan Museum and a study and research center of Nepalese architecture, conservation ideologies in the context of adaptive reuse and seismic strengthening, the possible spatial and legal relationships between an expanded Palace Museum and a rehabilitated Bhandarkhal Garden, and the nature of new construction that could take place on the garden side of the Palace structures. The mission also identified two pilot projects that could be implemented in concert with the Conservation and Management Plan.

The following report includes preliminary survey work and presents essential key findings of the Mission while identifying key project foci and related pilot projects with brief descriptions of history, existing conditions, conservation and restoration strategies, and potential adaptive reuse in the framework of an expanded Patan Museum. The Mission's principal goal was to identify foci and outline directions for research and documentation to focus the first year of planning.

Also included are notes on conservation methodology, a discussion of the issue of authenticity in the context of the process of restoration, and strategies developed by KVPT to improve traditional building techniques as they relate to seismic performance. A chronology of past research and reports on the Complex, and a preliminary demolition plan make up the appendices.



Aerial view of the Patan Royal Palace Complex
Photograph by Robert Kostka, November, 1986

KEY FINDINGS

1. As recognized by the 2006 World Monuments Watch, which included the Patan Palace Complex, general and **emergency interventions** are urgently required to check the decay and lack of maintenance at the site. In addition to roof repair and masonry stabilization, the conservation of timber and stone is equally urgent.
2. The restoration plan must engage **compatible and sustainable reuses** to address the long-term maintenance of the complex. Present uses of the Complex are often incompatible (school storage, laboratory in the Bhandarkhal garden, storage of debris) and indeed destructive (housing for guards, squatters, inappropriate commercial encroachment).
3. The Mission, in agreement with the Department of Archaeology, recommends the **expansion of the Patan Museum** as one appropriate and well functioning reuse of the complex. An expanded museum would provide exhibition space for the exploration of topics relating to Nepalese architecture, arts, and crafts.
4. The Palace Complex is the focus of the Conservation and Management Plan. Addressing the **adaptive reuse of the garden** was beyond the scope of this mission, but it was noted that any project proposals for the garden will have to be evaluated to assess any impact on the Palace Complex. The Bhandarkhal Tank, located in the garden, and the Kot Pati, creating the garden's southern edge, are critical built elements to be integrated into the Conservation and Management Plan for the Palace Complex.
5. The additive nature of the complex's morphological history is part of the richness of the site. While each historical layer deserves appropriate conservation consideration, the **addition of contemporary layers** may be justified as continuing the tradition of **additive growth**. The east facades of the Complex lack the rich complexity of the public west facades. While dialogue needs to be kept open about the nature of contemporary layers and uses to enliven the historic architecture, the issue of juxtaposing new elements with historic parts of the complex must be carefully studied.
6. Conservation strategies should be developed to **retain as much historic fabric as possible** but the modern needs of an expanded museum space must be recognized. A balance between compatibility and practicality must be maintained. Close partnership with the Department of Archaeology is crucial to the development of the highest standards of conservation and the development of appropriate adaptive reuse and management.
7. The restoration and conservation of the Patan Palace Complex would not only expand the world class Patan Museum but **make accessible** to visitors and locals alike **Patan's most underutilized cultural resource**.
8. Research, documentation, and the subsequent production of a detailed **historic structures report** is necessary for each project component.
9. Areas of further legal research include **issues of ownership**, avoiding possible development of the garden by other agents, and the legal framework of the Patan Development Board in its relationship to an extended Patan Museum.

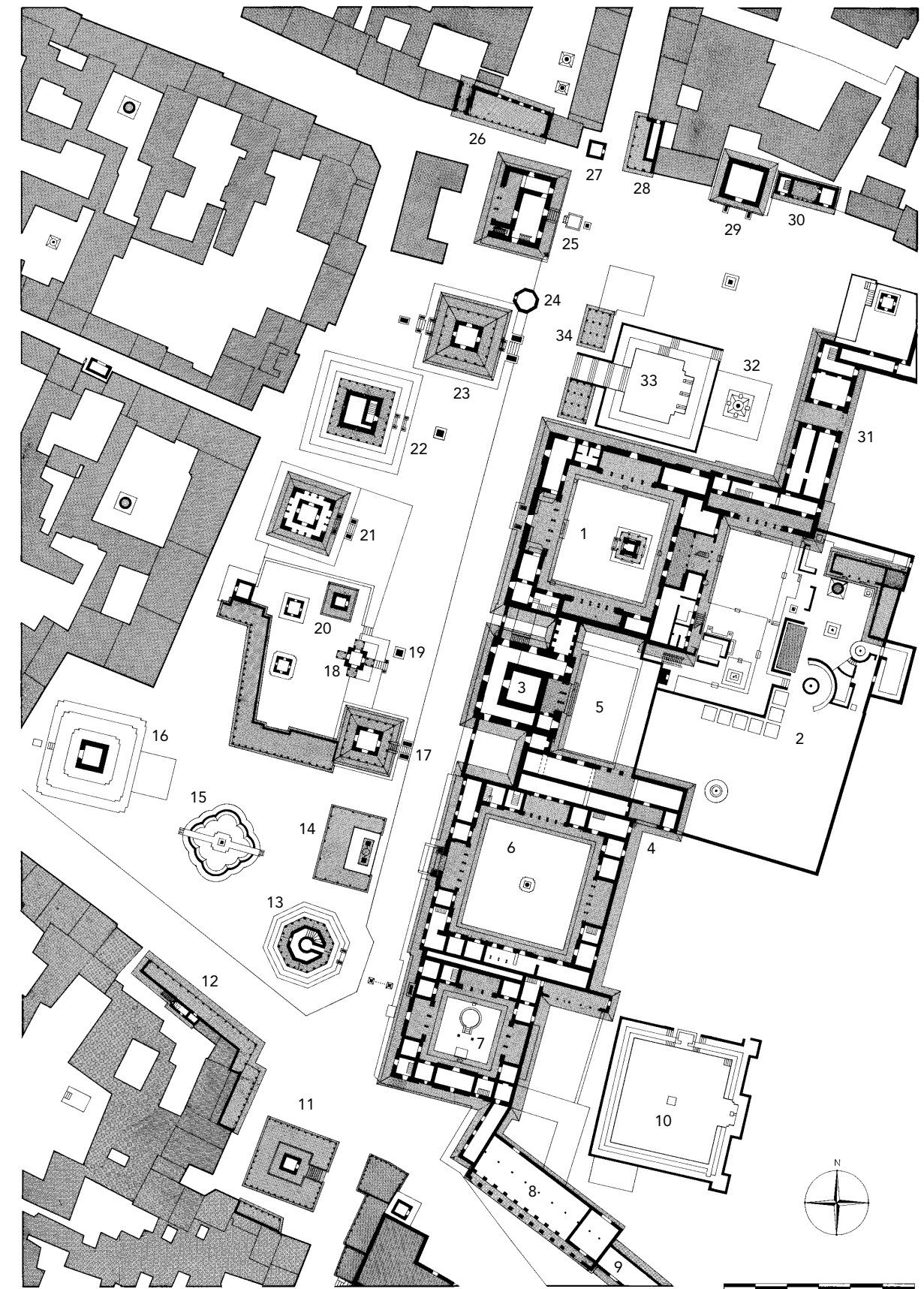


The Patan Darbar Square Monument Zone
prepared for UNESCO by Kai Weise, 2003

Plan of the Patan Darbar Square
Project foci and pilot projects of the Patan Royal Complex Project are indicated in bold.

1	Keshav Narayan Cok (Patan Museum)	1734
2	Café and Gardens	1997
3	Degutale Temple	1661
4	Taleju Temple	1671
5	Nasal Cok	1661
6	Mul Cok	1666
7	Sundari Cok	1647
8	Court Building	1810
9	Kotpati	1810
10	Bhandarkhal Tank	1647
11	Mahadeva Temple	17th c.
12	Lampati	17th c.
13	Krishna Temple	1723
14	Taleju Ghanta (bell)	1737
15	Fountain	1904
16	Vishvanath Temple	1678
17	Shankar Narayan Temple	1706
18	Narasimha Temple	1589
19	Yoganarendra Pillar	1693
20	Narayana Temple	1652
21	Char Narayan Temple	1566
22	Krishna Mandir	1637
23	Vishveshvara Temple	1627
24	Manigupha ("cave")	17th c.
25	Bhimsen Temple	1680
26	Lakhe Shrestha Agam	17th c.
27	Kopeshvara Temple	1893
28	Sarasvati Pati	17th c.
29	Maniganesha Temple	17th c.
30	Ayahguthi Sattal	17th c.
31	Bahadur Shaha Palace	1792
32	Manicaitya	17th c.
33	Manidhara (stepwell)	570
34	Manimandapa	1701

Plan based on surveys by Carl Pruscha & Wolfgang Korn, Niels Gutschow & Bijay Basukula, Eduard Sekler & Michael Doyle, Erich Theophile & Rohit Ranjitkar, and Kuatsuhiko Watanabe. Compilation by Götz Hagmüller, drawing by Sushil Rajbhandari, 1996



SITE OVERVIEW & PROJECT COMPONENTS

Located within the World Heritage Site of Patan Darbar, the Patan Royal Palace Complex is one of three urban palace precincts created by the Malla kings of the Kathmandu Valley. The main palace quadrangles were constructed at an ancient crossroads in the seventeenth century during a significant period of architectural patronage by King Siddhinarasimha Malla (r.1619-1661) and his son, Srinivasa (r.1661-1684). As a backdrop to the 17th century royal buildings, the site contains a continuum of building activity from the 6th to the 20th centuries presenting a richly layered assemblage of courtyards, temples, sculpture, water features, and garden space. Mirrored on the west by the multi-tiered roofs and towers of royal temples, the Palace Complex completes one of the finest historic urban compositions in South Asia.

In spite of its rich historical fabric the Palace Complex remains largely unused and poorly maintained. While the highly acclaimed Patan Museum has brought life to Keshav Narayan Cok (the complex's north courtyard which was built around 1680 and restored in 1983-1997), the remaining spaces of the complex are derelict, filled with debris, and used inappropriately to house guards and squatters. Ritual use of the site has declined over time and is now limited to the display and procession of a royal sword, and the rites associated with the worship of the tutelary goddess of the Malla kings.

To the east of the palace courtyards is the two acre Bhandarkhal or "Treasure Garden," which contains a 17th century tank constructed contemporary with the Tusha Hiti of Sundari Cok (the Complex's southernmost courtyard), three historic open air shrines, and a collection of buildings occupied by administrative offices of the Department of Archaeology. The history, function, and adaptive reuse of the Bhandarkhal must be studied in order assess its present and historical relationship to the palace precinct and to understand its development potential.

Research and documentation for the Patan Royal Palace Complex project will comprise six major components and are presented here chronologically. Discreet historic structures reports will to be produced for each in order to guide conservation work.



Aerial view of the Patan Royal Palace Complex
Photograph, 2005



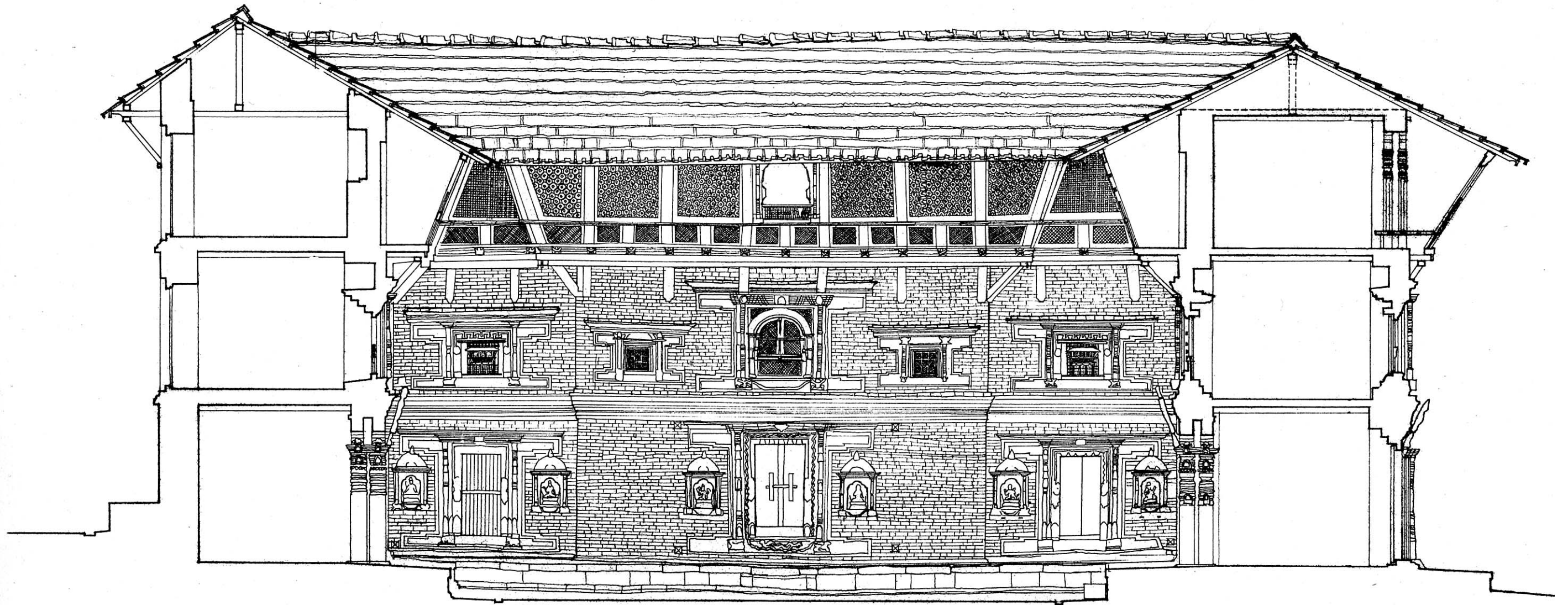
Patan Darbar Square from the south
The caption reads “General Juggut Shumshere
(Jung Bahadur’s brother) and suite can be seen
in the foreground.”
Photograph by Clarence Comyn Taylor, ca. 1863
Royal Geographical Society, S0003074



Patan Darbar Square from the north

One of the earliest views of the square with Mul Cok and Sundari Cok at the center. Comparison with contemporary photos shows that the historic ridge levels of the two palaces were more than 60 centimeters higher than at present.

*Photograph by Clarence Comyn Taylor, ca. 1863
Royal Geographical Society, S0003077*



0 1 2 3 4 5 meters

Sundari Cok - section looking south
Existing conditions
Survey by the Nippon Institute of Technology, December, 1977

SUNDARI COK AND TUSHA HITI

CONSTRUCTED BY SIDDHINARASIMHA MALLA 1627 AND 1647

Preliminary remarks

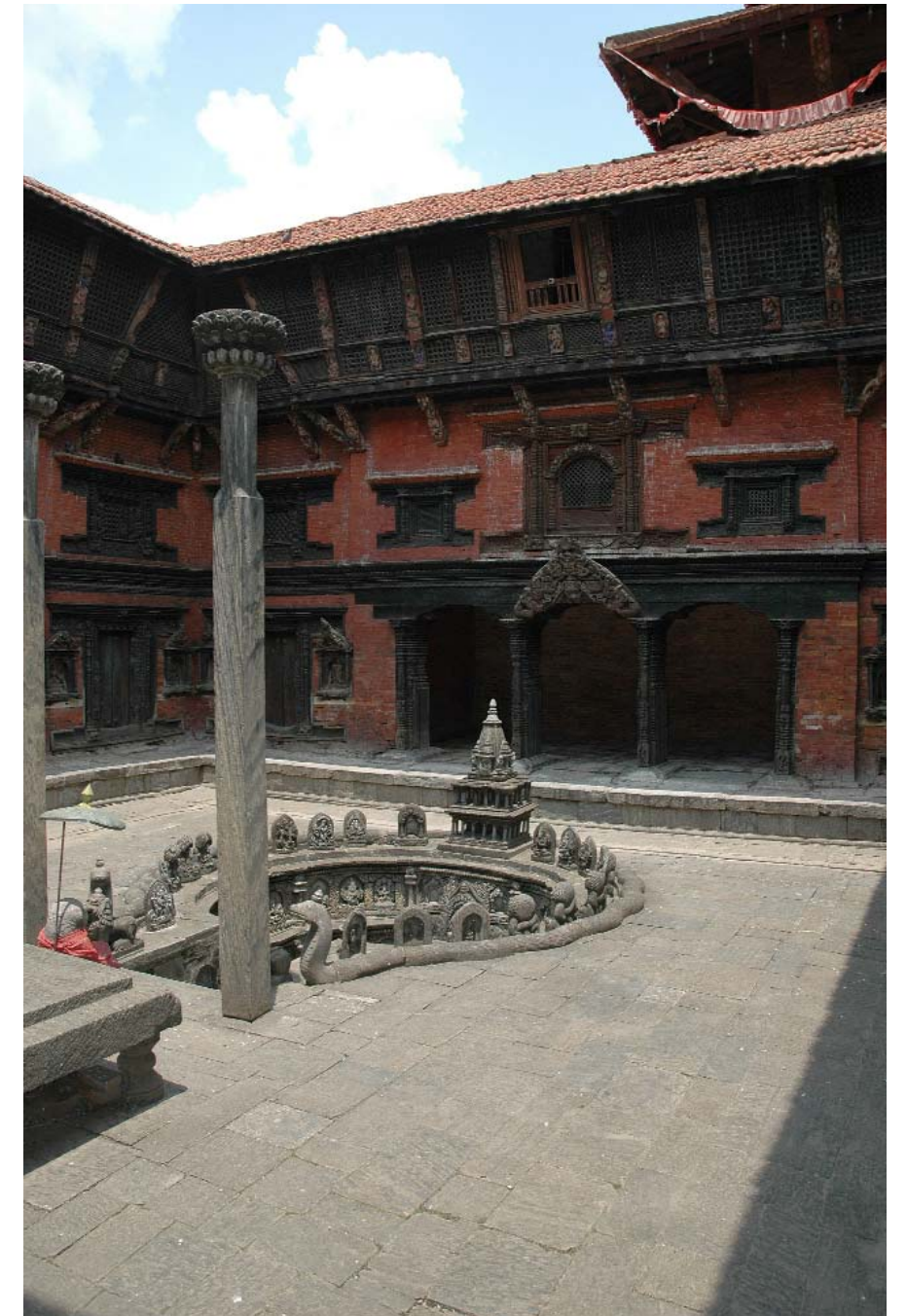
Sundari Cok is the earliest surviving royal quadrangle of the Patan Royal Palace Complex and is regarded by many scholars as the most important example of Malla-period palace architecture for the richness of its largely intact façade carvings and for its pleasing proportions. The building, roughly 17 meters by 17 meters, consists of four three story wings that surround a court that is paved in stone. At the center of this paved courtyard is an elaborately carved stone step-well that was constructed for ritual purposes for the Malla king. Load bearing masonry walls exhibit high-fired veneer brick (Newari *daci-apa*, typical of temples and royal buildings) and are punctuated by richly carved timber windows, doors, and arcades. The east elevation contrasts starkly with the rest of the building for its poverty of ornament and use of ordinary brick. The interior of the southwest corner of the first floor contains what appear to be 17th century wall paintings and carved timber door and window frames, and a corner window seat. It appears that at least some of the interior stairs of the quadrangle are not in their original locations. Historically inaccurate terra cotta pan tiles cover a later reconstructed roof structure.

Recent research suggests that the Patan King Siddhinarasimha Malla constructed Sundari Cok during the year of the birth of his son and successor Srinivasa Malla in 1627 and that the masterfully carved step well Tusha Hiti was installed in its court in 1647 during renovations.¹ In *Nepal Mandala* Mary Slusser writes that Srinivas Malla continued his father's penchant for building and embarked upon extensive renovations to the Palace which, apparently, included Sundari Cok in 1666.² Further renovations and repairs likely took place during the 18th and 19th centuries.

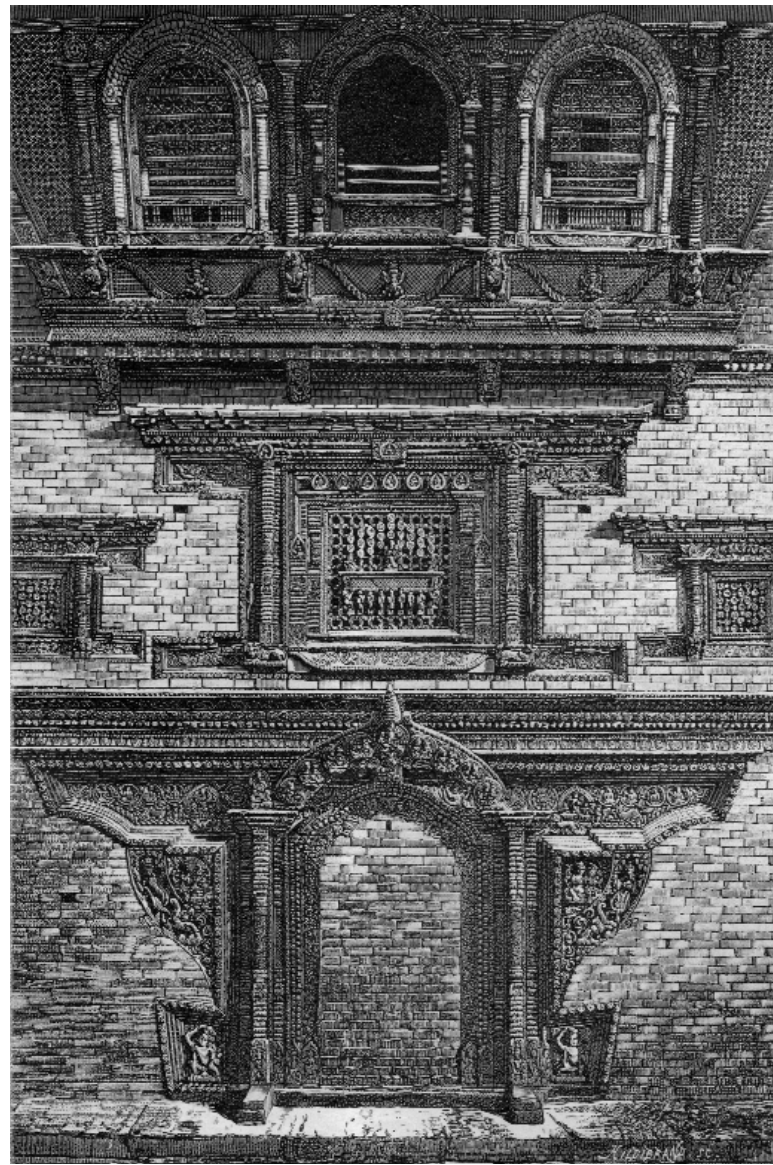
The upper story raises many questions. From its carving style it appears to date from a later period than that of the ground and first floors. We know from Daniel Wright of at least one major earthquake in 1830.³ While the two lower floors appear to retain most of their original 17th century carvings, the upper story appears to be a 19th century rebuilding. Pre-1934 photographs show the roof already rebuilt with larger Indian terra cotta tile. We know from photographs that the east wall of the quadrangle and the entire roof structure were reconstructed after the 1934 earthquake. Additional roof rebuilding and makeshift repairs occurred during the coronation ceremonies of King Mahendra and Birrendra during the 1950s and the 1970s. The building was documented in 1992-95 by a UNESCO team. No repairs or clean-up were undertaken as part of that project. As this is clearly the most significant structure of the complex, the historic structure report will review historical evidence in detail, study surviving fabric, and present a detailed construction history.

Existing Conditions

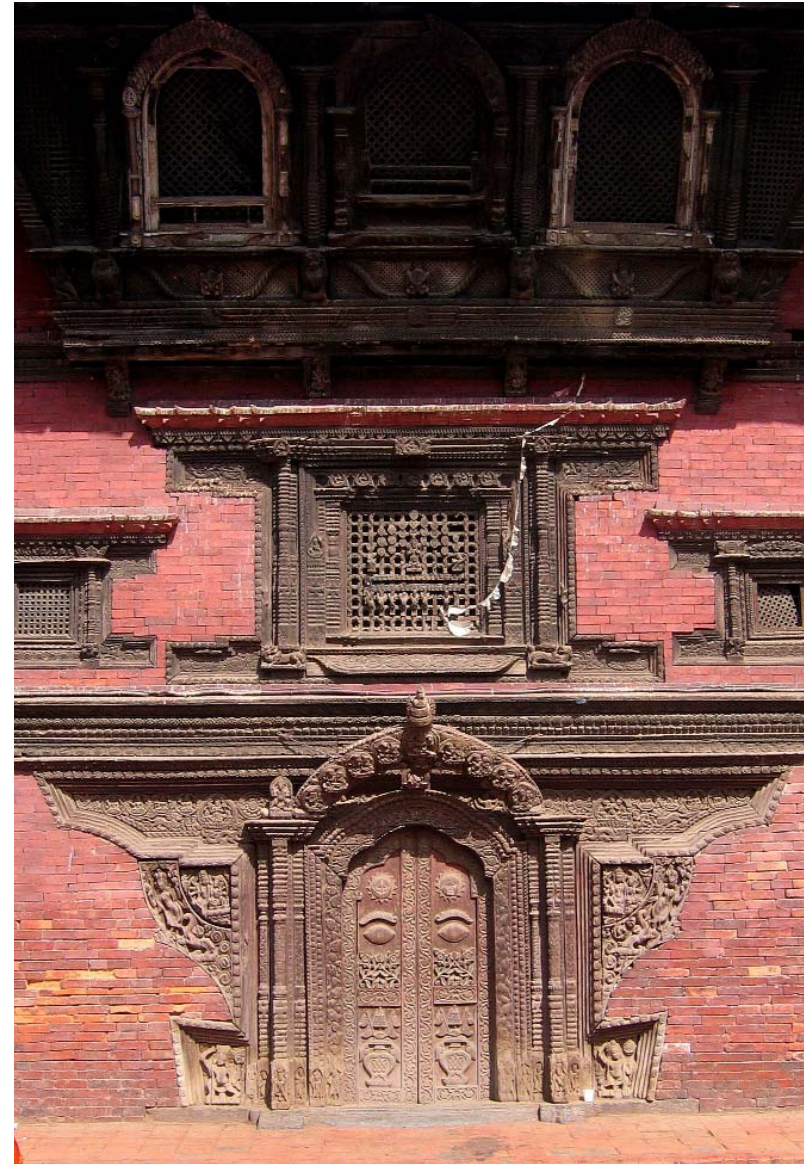
Sundari Cok is in notably poor repair. A recent and makeshift rebuilt roof structure and cover are in poor condition. There are numerous locations where there is water infiltration and danger of collapse of the roof framing. Moreover, most of the interior spaces are filled with rubble and garbage. Some spaces are used by guards for cooking and sleeping. The southern wing has been encroached upon by shopkeepers. A recent structural assessment indicates the separation of brick veneer from a mud and rubble



Sundari Cok courtyard and Tusha Hiti
Photograph May 2006



Sundari Cok's main entry
 It is not known why the main door was bricked up.
Engraving after a photograph by Gustave Le Bon, 1885



Sundari Cok's main entry
 With the exception of inappropriate carved doors which date to recent renovations the appearance of the main entry has changed little in 130 years. Traditionally such door leaves would have been unadorned slabs of timber.
Photograph, May, 2006

back-up wall at the ground floor level. Typical of makeshift post-earthquake repairs is the use of non-historic pan tiles. These light-weight tiles use a completely different structural system spanning small timber blocking in contrast to the typical traditional roof tile (Nepali *jhingati*) system which uses smaller tiles over a heavy mud bed and more substantial timber structure.

With the exception of the east-facing elevation, carved window and door elements and historic masonry fabric appear to be complete and intact. Most of the iconographic program of carving (roof brackets, tympana, niche figures) is intact but notable exceptions include a series of figures in the niches of the ground floor courtyard. Of these, only one 17th century figure appears to survive. The remaining are poor replacements installed in the 1970s. Interior finishes are rough and failing in many places. With the exception of wall paintings in the southwest first floor area (which likely served as a royal reception space) all walls appear to be unadorned mud plaster. The ground level of the rear area abutting the east wing of Sundari Cok is 60-90 cm higher than the historic level and has caused damaging water infiltration at the base of this wing.

The royal fountain, or Tusha Hiti, appears to be in relatively intact condition but has been sloppily repaired and repointed in recent decades. Some images from the rich iconographic program of stone sculptures that adorn the bath appear to have been stolen or replaced. Water does not presently flow from the tap. The gilded copper tap and attendant figures appear to be in good condition but some elements may be missing.

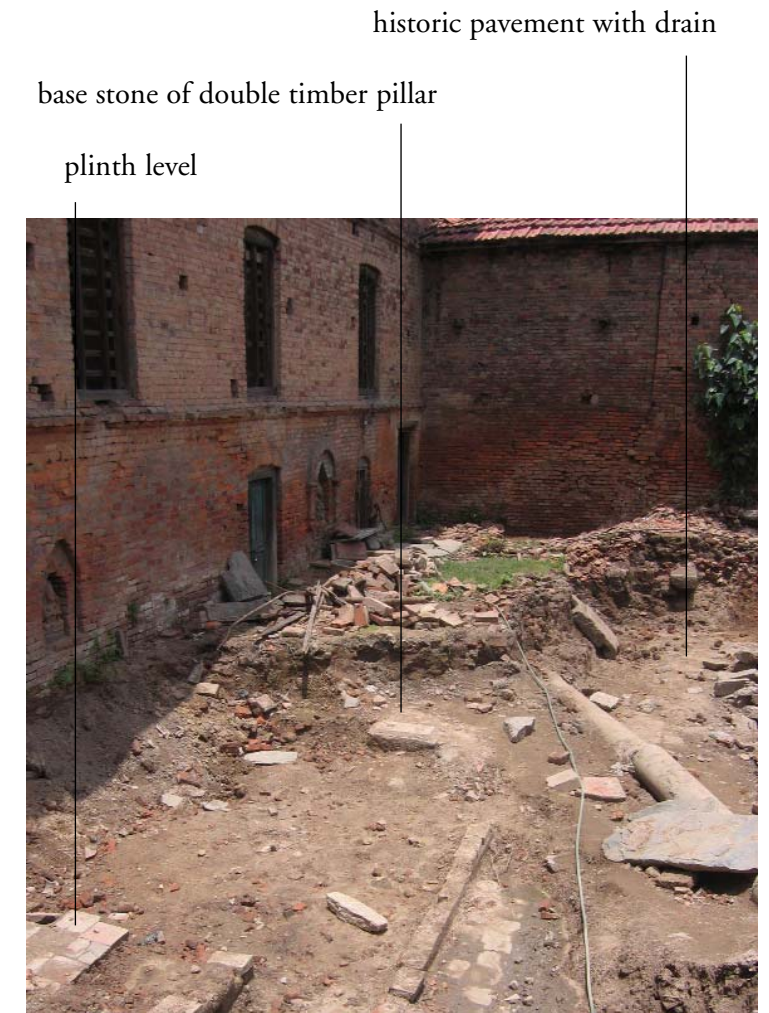
Conservation and Restoration

Conservation challenges include the repair and upgrading of the roof structure to protect the building. The question of which period of the building should determine the restoration of the roof cover will be a critical issue for the conservation design. Recent visiting experts recommended repair of the 20th century roof cover. This team is of the opinion that the historic roof structure and *jhingati* roof cover should replace the later, inferior structure and cover. Also critical for conservation design is the approach to the restoration of the fine wood carvings; where should damaged or missing lacunae be repaired or remade? An exhaustive survey of all the carvings and an analysis of the iconographic program will investigate these questions. Important questions at the building scale include earthquake strengthening and adaptive reuse interventions, as the Government of Nepal is proposing the extension of the Patan Museum in this building.

Original construction techniques and pointing materials for the Tusha Hiti will need to be studied as will the appropriateness of recreating missing stone and metal elements. As with the wood carvings of Sundari Cok, the preparation of an exhaustive survey of the program of carved stone and gilded copper elements will help inform an appropriate conservation design for the bath. If water supply to the Tusha Hiti is to be re-established, a recent proposal for the restoration of the water source of the Tusha Hiti will need to be coordinated with conservation work there.⁴

Additional notes

The Krishna Temple toward the north of the west side of the Patan Darbar Square was also constructed by Siddhinarasimha Malla in 1637. Siddhinarasimha's fondness for this temple may explain the presence of a miniature replica of the temple above the gilded copper tap of the bath.⁵ More research is required to assess the historic ritual use of Tusha Hiti. Comparative studies of the royal baths of the Kathmandu and Bhaktapur palaces would constitute a fruitful start for such research.



Sundari Cok, garden courtyard

Excavation carried out in May 2006 revealed the historic paving level matching the height of the interior courtyard. Several base stones for pillars were found, indicating that there might have been an open arcade adjacent to Sundari Cok's Eastern wing.

1. Bjonness, Hans, et al. 1995 *Documentation of Sundari Chowk* HMG/UNESCO/Japan Trust Fund project 536/NEP/71
2. Slusser, Mary S. 1982 *Nepal Mandala* Princeton University Press, Princeton, New Jersey
3. Wright, Daniel, ed. 1877 *History of Nepal* Ranjan Guptan, Calcutta
4. Joshi, Prayag Raj, and Theophile, Erich 1992 *Historical Hiti and Pokhari: Traditional Solutions to Water Scarcity in Patan* UDLE, GTZ, Kathmandu, Nepal
5. Slusser, Mary S. 1982 *Nepal Mandala* Princeton University Press, Princeton, New Jersey



Sundari Cok courtyard looking south
Photograph by Stanislav Klimek, October, 2006



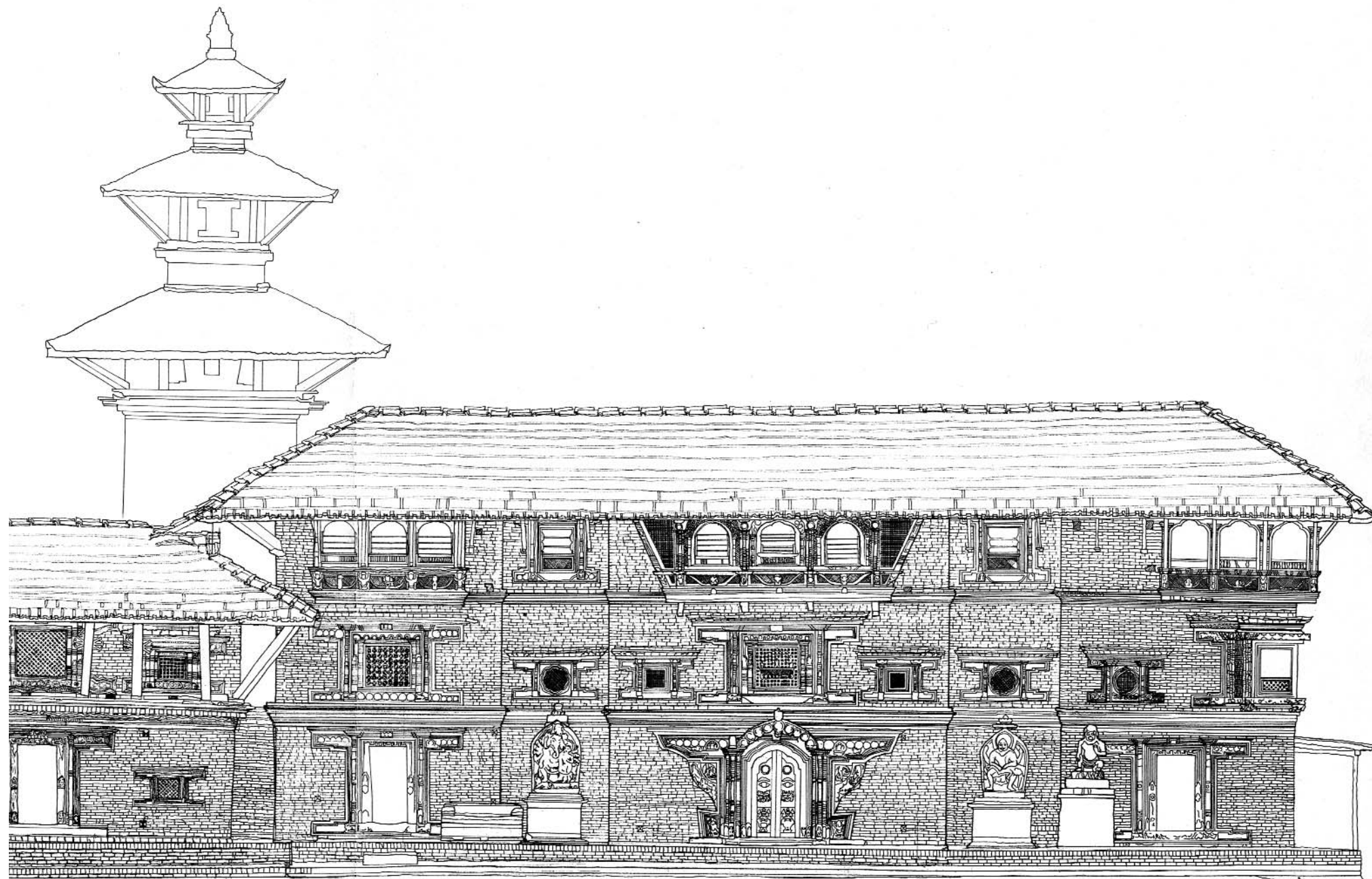
Sundari Cok courtyard looking west
Photograph by Stanislav Klimek, October, 2006



Sundari Cok courtyard looking north
Photograph by Stanislav Klimek, October, 2006

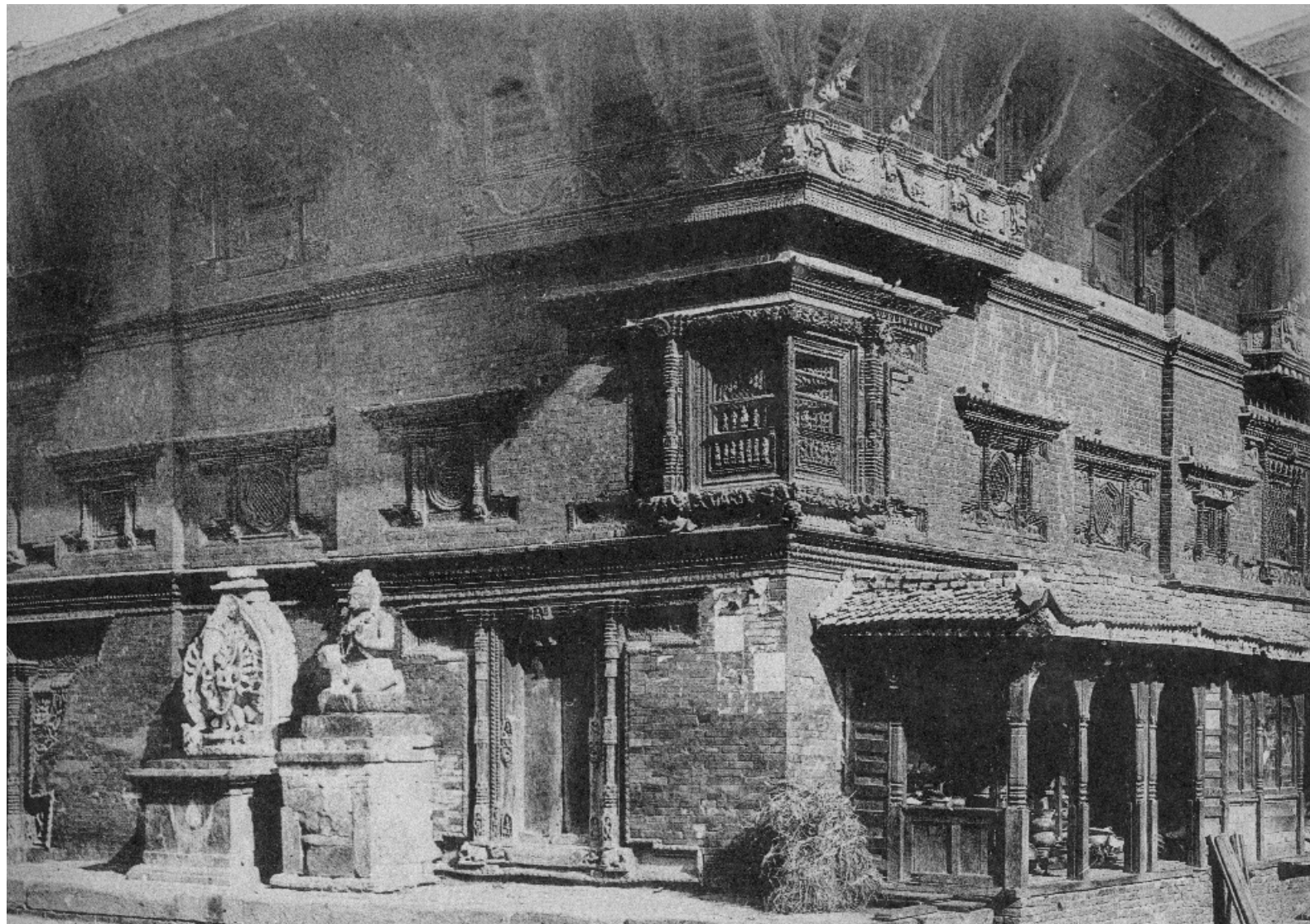


Sundari Cok courtyard looking east
Photograph by Stanislav Klimek, October, 2006

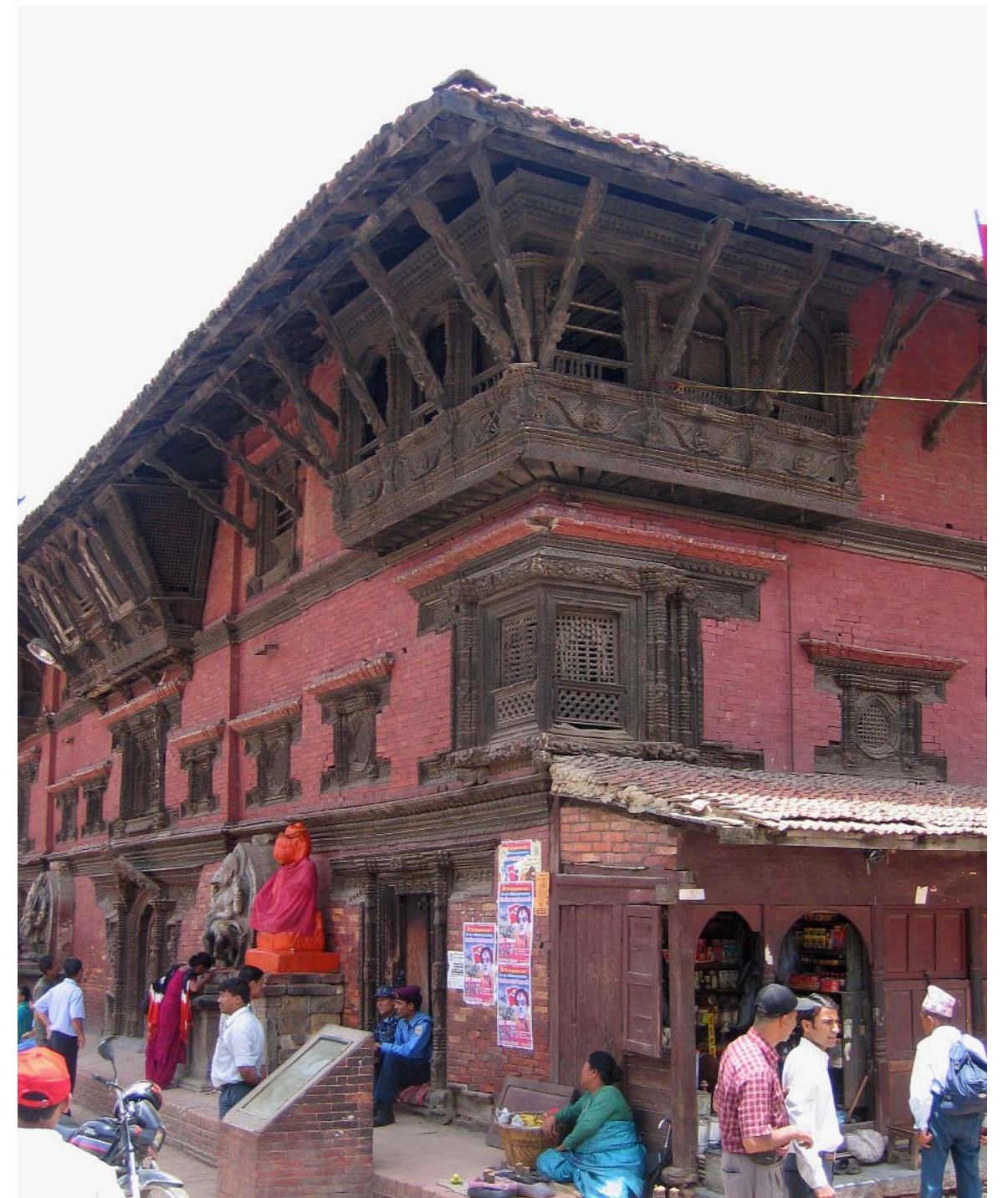


Sundari Cok - principal facade
Existing conditions
*Survey by the Nippon Institute of Technology,
December, 1977*

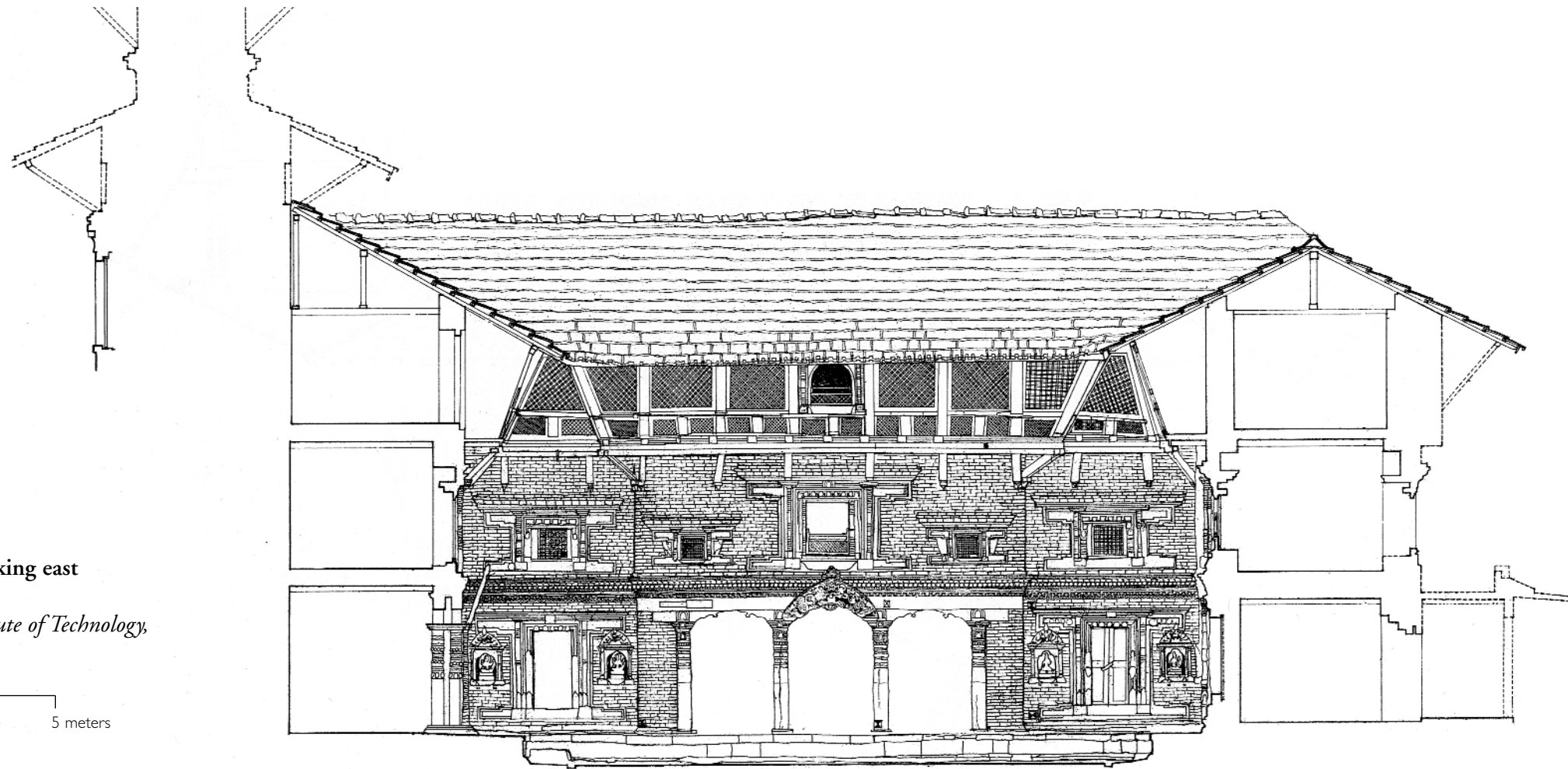
0 1 2 3 4 5 meters



Southwest corner of Sundari Cok
 Note the presence of a commercial structure
 constructed at the south facade.
Photograph by Gustave Le Bon, 1885



Southwest corner of Sundari Cok
 The general appearance of the Complex's southernmost courtyard
 has remained essentially unchanged over the last 130 years. Note the poorly
 constructed commercial lean-to at the structure's southern edge.
Photograph, May, 2006



Sundari Cok - section looking east
Existing conditions
*Survey by the Nippon Institute of Technology,
December, 1977*

0 1 2 3 4 5 meters



Northeast gate leading to the Bandharkhal Tank and Garden

The surface of the historic brickwork shows damage due to rising damp. Note that the timber threshold has become dislodged. Only one of sixteen original carved timber figures in the niches that flank the doorframes in all elevations survive; the remaining 15 have been replaced in poor quality.

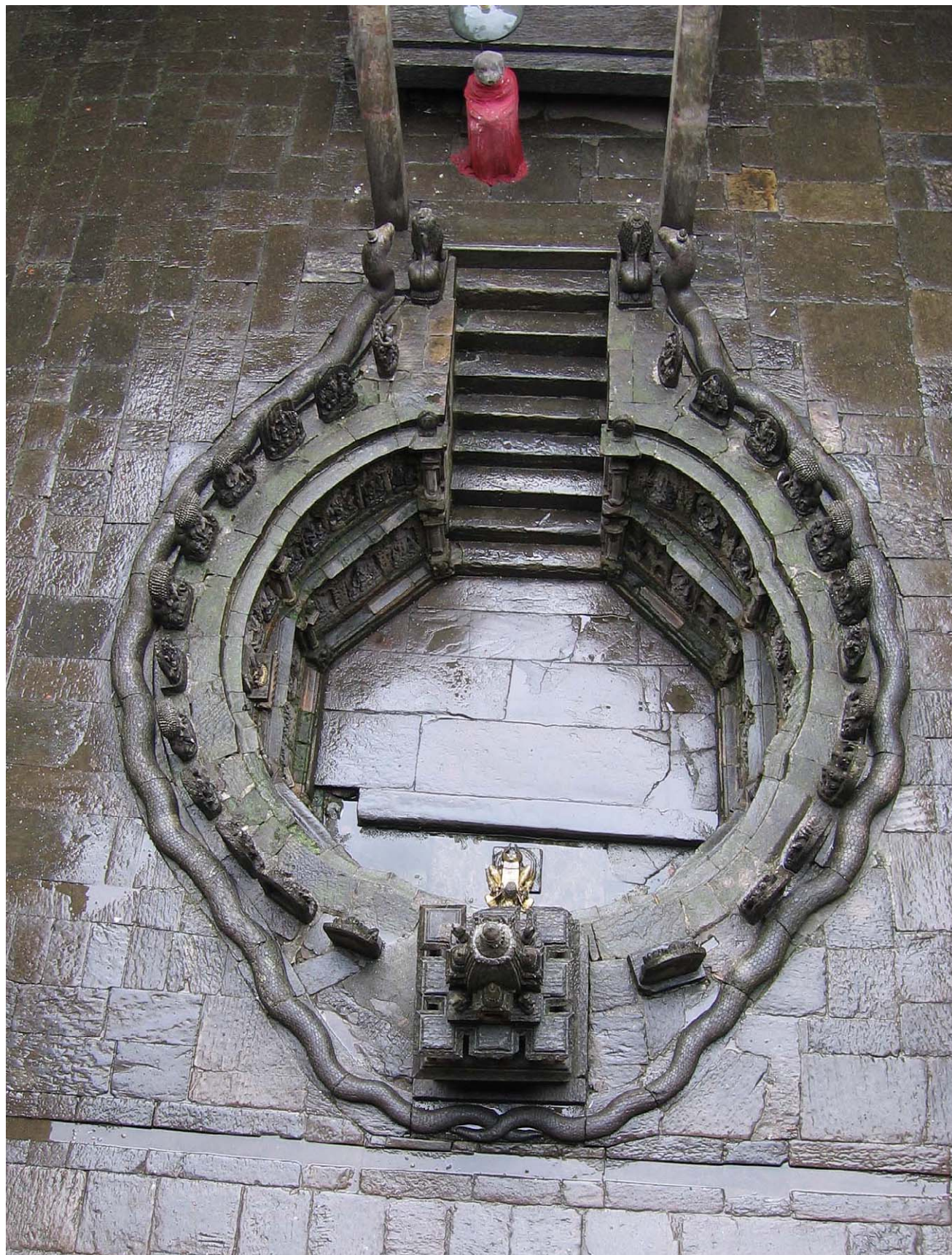
Photograph, May, 2006



Tusha Hiti

Siddhinarasimha's carved stone ritual bath with a miniature version of the Krishna Temple at its north edge. Stone conservation measures will need to be developed that take into account original construction methods and pointing material.

Photograph, May, 2006



above: Stone carved deities surrounding the bath
Portland cement has been used to reset many stone elements of the bath. *Photograph, May, 2006*

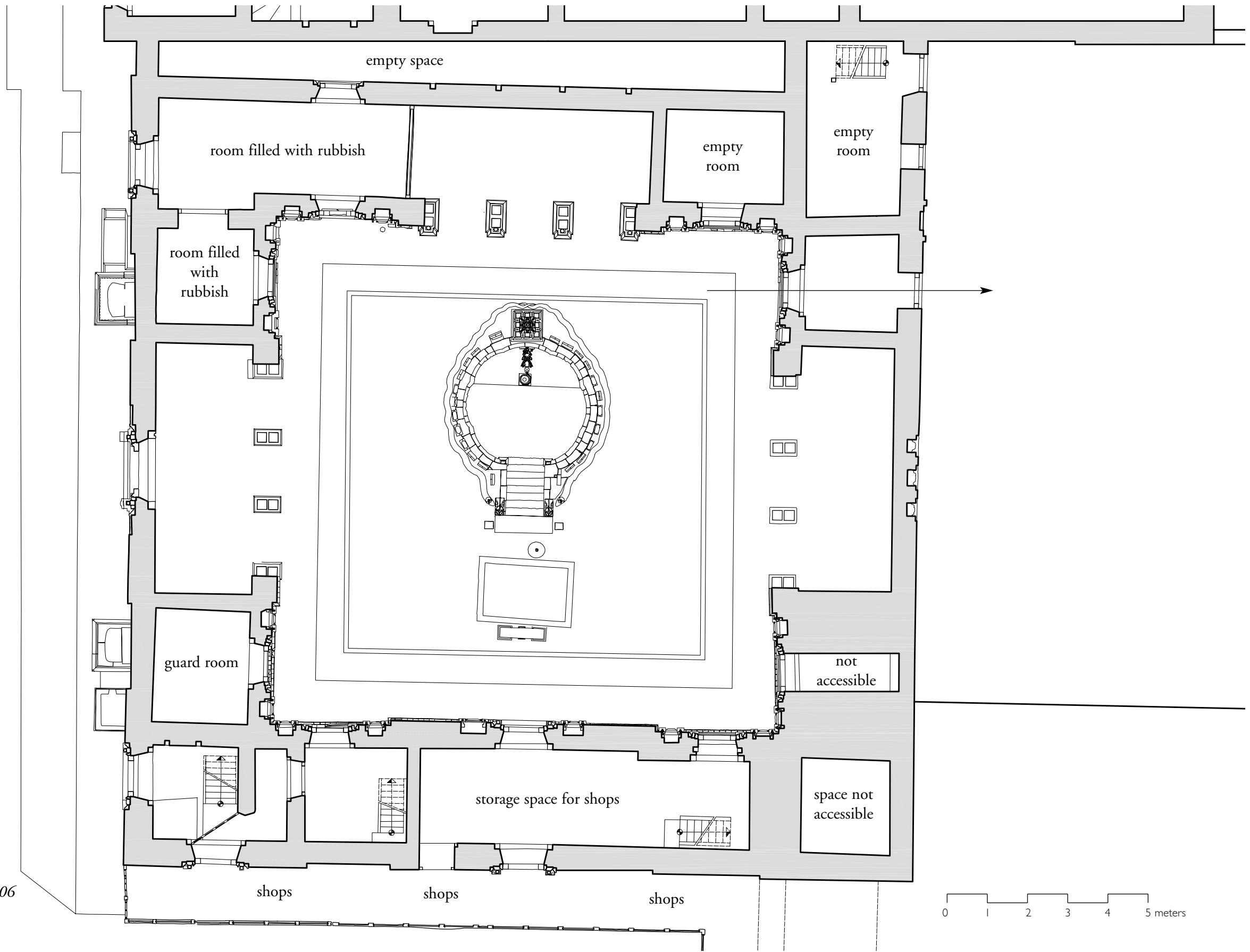
left: A miniature Krishna Mandir
It is unclear how the stone elements were originally fitted together and pointed. *Photograph, May, 2006*



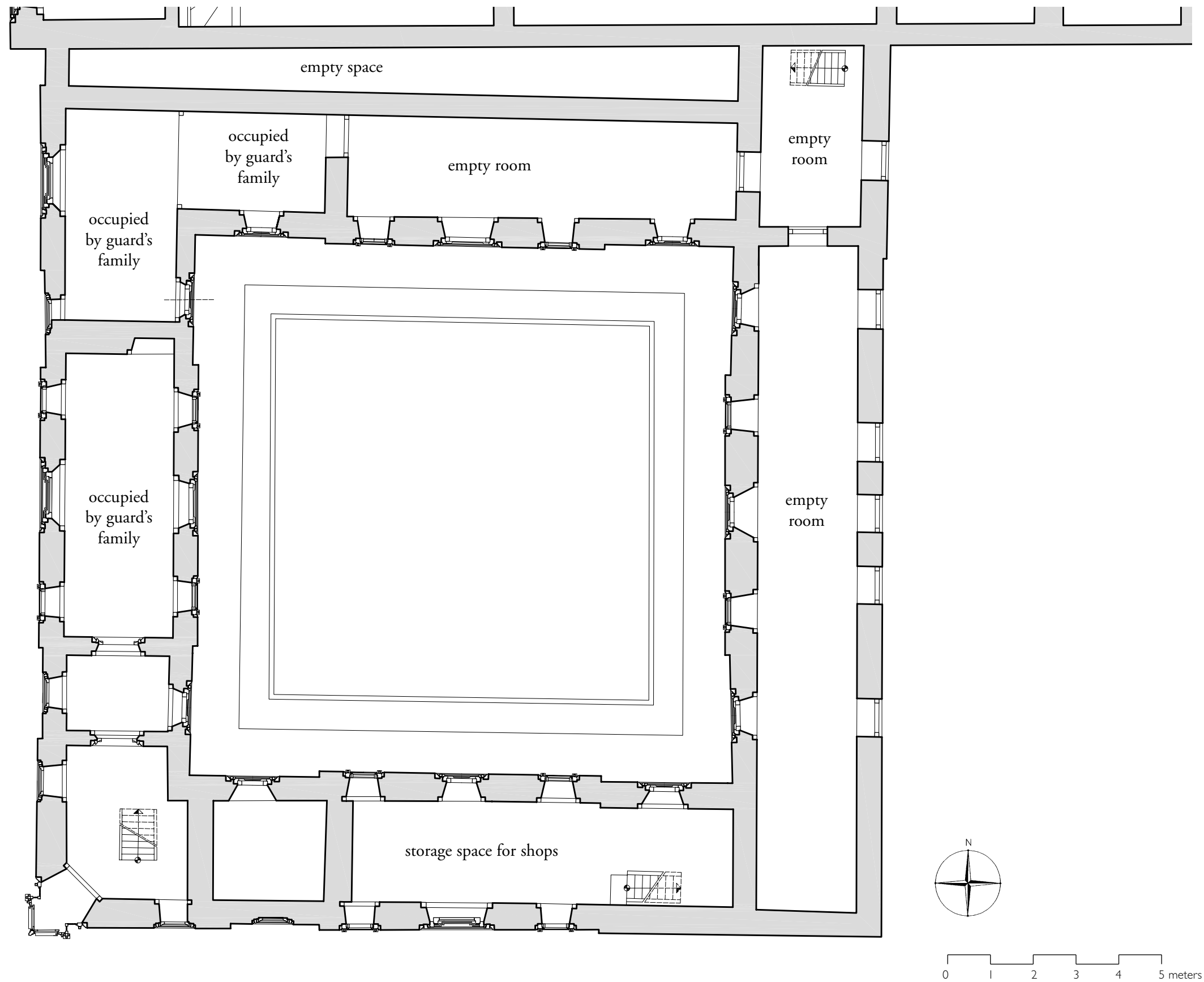
above: Gilt copper tap of the bath
Metal conservation and restoration methods will need to be developed to address cleaning and replacement of missing elements.

left: Carved deities of the blind arcades of the bath

far left: View of the bath from above



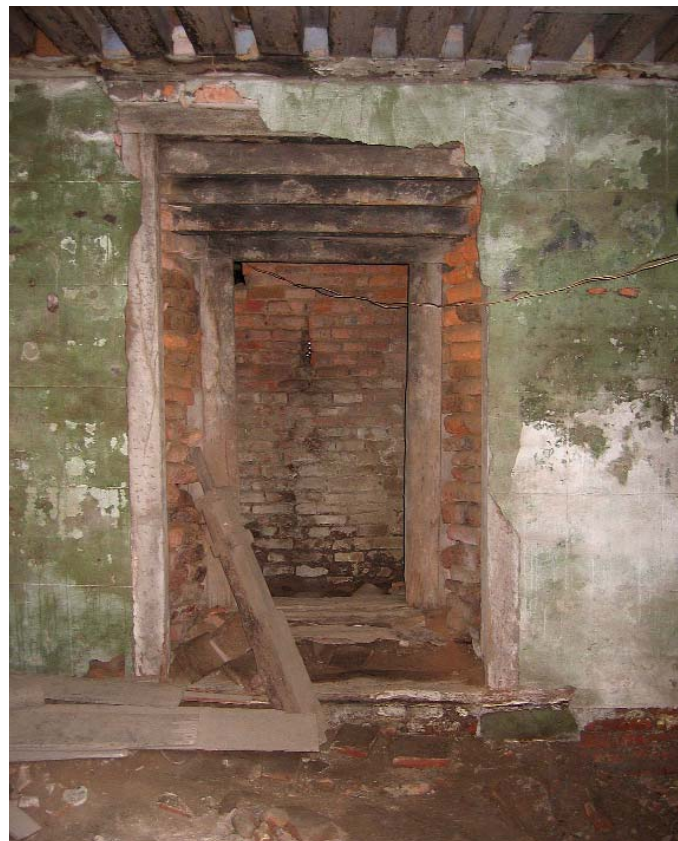
Sundari Cok - ground floor plan
 Existing conditions
Drawing by Anil Basukala, May, 2006
after a survey by Hans Bjønness



Sundari Cok - first floor plan
 Existing conditions
Drawing by Anil Basukala, May, 2006
after a survey by Hans Bjønness



far left and left:
Medicine shops in front of Sundari Cok and the Court Building
 Ever since the earliest photographic documentation available these small shops have been occupied by traders of Ayurvedic medicine and other food and household items. Adjacent lower and first floor rooms in Sundari Cok and the Court Building serve as storage rooms. The stalls' roofs are in poor condition and only a few carved timber elements remain from the 19th century.
Photograph, 2006.



far left:
Storage room on the first floor of Sundari Cok
 Parts of the courtyard's southern wing is used for storage by the medicine shops located in the southern shed.
Photograph, 2006.

left center:
Ground floor room in the northwest corner of Sundari Cok
 Rising damp has taken its toll on brick walls and ceiling joists. Broken floor tiles and cement patching of walls reflect the poor maintenance record.
Photograph, 2006.

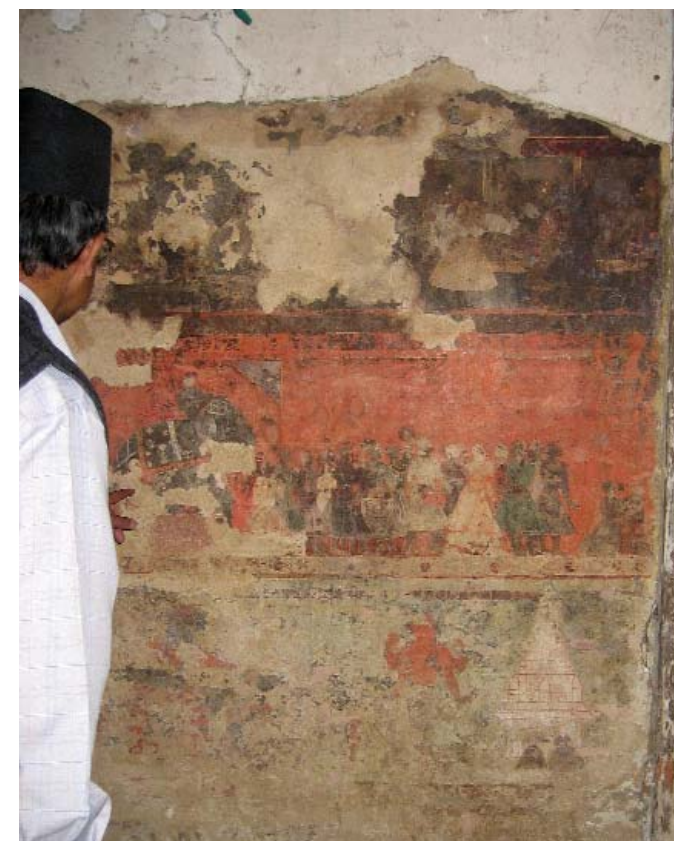
left:
East wing ground floor
 Termite infestation can be observed throughout the building.
Photograph, 2006.



Rear (east) facade of Sundari Cok

This part of the east wing was rebuilt after the 1934 earthquake. Due to shortage of funds and building materials regular bricks were used and simple windows installed. The historic configuration of this facade was most likely similar to the other facades although no historic records of what it looked like exist. The building to the left is an addition dating from the 1970s when Sundari Cok was used as a police post and temporary jail.

Photograph, 2006.



far left and left center:

East wing of Sundari Cok, top floor

This photos illustrate the poor state of repairs. The roof framing incorporates salvaged timbers, possibly from collapsed buildings after the 1934 earthquake. Rafter dimensions and spacing do not match historic examples. The modern tile roof is damaged in many places causing severe water infiltration. This room will be used as a gallery for the proposed architecture or crafts museums.

Photograph, 2006.

left:

East wing of Sundari Cok, first floor

Traces of wall paintings that were cleaned by a UNESCO supported team of experts in 1998.

Photograph, 2006.



View of the Palace Complex from the Bhandarkhal Tank
Unsigned pencil sketch, attributed to Rajman Singh, ca. 1844
Hodgson Collection of the Royal Asiatic Society

BHANDARKHAL TANK

CONSTRUCTED BY SIDDHINARASIMHA MALLA 1647

Preliminary remarks

The most prominent Malla-period feature of the Bhandarkhal (treasure garden, from the Sanskrit *bhandagara*, treasury), to the east of the structures of the Palace complex is a terraced brick-lined tank that measures approximately 16 meters x 16 meters. Three concentric terraces rise up to grade around the tank, the lower two are faced in stone and the upper in brick. At the center of its north edge the tank is marked by a relief-carved stone pavilion that rises above the terraces. At the east, the lowest terrace extends to create a deeper paved area where a stone water tap (Nepali *dhunge dhara*) is flanked by votive images, guardian figures, and lions. At the center of the tank is a square brick pedestal with a gilt copper lotus set upon a copper column.

Mary Slusser writes that while engaged in the construction of the Tusha Hiti, King Siddhinarashimha established a garden and tank to the east of the palace in honor of Taleju. The tank was constructed with a gilded copper lotus installed at the center and was intended to provide the King with flowers for offerings at the Taleju shrine. Water was apparently supplied separately to the tank but the Tusha Hiti drained into it. The pavilion at the north edge of the tank is said to have been used by the King for meditation. In 1675 after having long abandoned the throne Siddhinarasimha set up a stone tablet for his son Srinivas describing the rules and regulations governing its use.

19th century views of the tank show a tiled timber structure on top of the stone pavilion that may date to the original construction. The retaining wall of the upper east terrace of the tank contains a Licchavi period stone sculpture of Vishvarup Vishnu (still actively worshiped by a local Brahmin). A detailed repair and reconstruction history is unknown.

Existing Conditions

The tank presently does not hold water despite recent relining with brick over a historic layer of lime cement. The terraces that surround the tank are faced in what appears to be a crudely dressed yellowish sandstone. Many of these stones are inscribed with numbers which suggest an earlier effort to catalogue pieces for reconstruction. Many joints have been sloppily pointed with modern cement. The decorative border stones that line the top and bottom of the terrace faces are often crude, do not match, and appear inconsistent with what one would expect for such a royal donation. A brick and lime plaster balustrade was added to the north pavilion in honor of the coronation of King Mahendra in 1955 replacing what might have been the timber and tile structure seen in early 19th century views of the tank.

Grade level surrounding the tank rises more than one meter above the historic paving level which presumably corresponded with the level of the middle terrace. The third or upper terrace is really a retaining wall constructed to accommodate the increase in grade caused by the accumulation of post-earthquake debris. Moss and lichens were observed on the terraces and faces of the south side of the tank.



Bhandarkhal Tank seen from the South
Originally, the level of the surrounding park was at least 1 1/2 meters lower.
Photograph, May, 2006



View of the Patan Palace across the Bhandarkhal Tank

Henry Ambrose Oldfield, ca. 1853

Inscribed on reverse: "Rajah Sidhi Nur Singh's tank and Summer House, in the Garden at the rear of the Darbar, Patan - constructed AD 1647".

British Library, Oriental and India Office Collection, WD 3309, wash 25.3x33.6cm

Conservation and Restoration

If function to the tank is to be re-established it will need to be relined. The restoration of function to other historic tanks in the Valley has involved the removal of modern brick lining and the installation of a new layer of lime cement over a moisture barrier. These projects should be studied for reference.

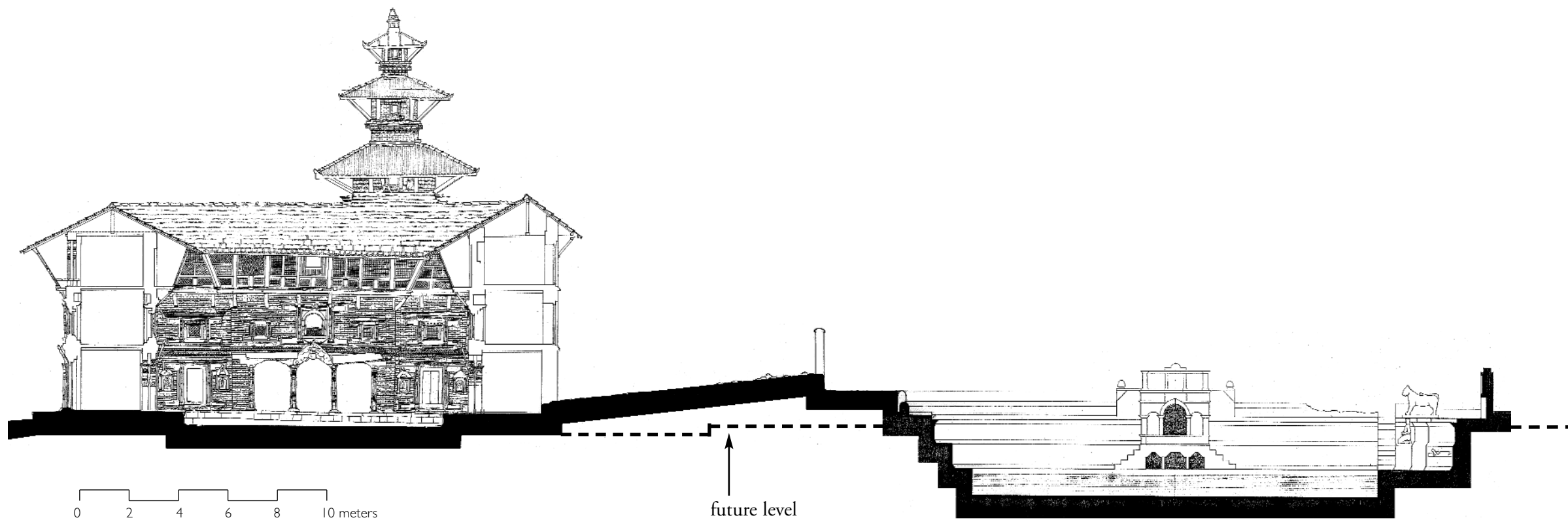
The stone carvings of the north pavilion were apparently damaged during a cleaning campaign in the early 1990s. Careful cleaning and pointing methods will need to be developed to redress this damage and prevent future deterioration.

19th century views of the tank provide sufficient documentation to reconstruct a tile and timber superstructure at the north pavilion. Research is needed to establish the appropriateness of such a reconstruction.

Siddhinarasimha's gilded lotus is now placed on a pedestal much higher than the historical water level. Research is required to determine if re-installation of the lotus should correspond with the restored water level.

The raised grade level around the tank and the resultant third terrace surrounding the entire structure substantially effects the perception of the volume of the terraced tank and the reading of the north pavilion as a discrete and partially freestanding structure. Investigative excavation around the tank to determine historic paving levels is recommended as is consequent re-grading and repaving to historic levels.

If restoration of function is undertaken work will need to be coordinated with a recently proposed plan to restore the original water sources of the Tusha Hiti and tank. (see Joshi, Prayag Raj and Theophile, Erich, 1992, *Historical Hiti and Pokhari: Traditional Solutions to Water Scarcity in Patan*, UDLE, GTZ, Kathmandu, Nepal.)



Sundari Cok and the Bhandarkhal Tank: Montage of Sections

This montage of different surveys illustrates the relationship of Sundari Cok with the Bhandarkhal Tank. Note the raised grade to the east of Sundari Cok which resulted from the accumulation of rubble after the 1934 earthquake.

Bhandarkhal section by Valerio Sestini and Enzo Somigli, 1978-1982



Comparative Views of the Bhandarkhal Tank Pavilion

Early 19th century views confirm a lower grade level around the Bhandarkhal Tank. Accumulation of debris around the tank has essentially “buried” the north pavilion which originally appeared as a free standing element at the north side of the upper retaining wall. Note the renovations to the pavilion’s superstructure completed for King Mahendra’s coronation in 1955.

above: Henry Ambrose Oldfield, ca. 1853

British Library, Oriental and India Office Collection, WD 3309, wash 25.3 x 33.6cm

above right: Photograph, May, 2006



View of the Tank looking North

Recent brick relining of the tank failed to make it water-tight. The generally poor condition of the stone facing has been exacerbated by poor repointing and damaging chemical cleaning. The gilt copper lotus was likely originally installed at water level. Note upper brick retaining wall added after the 1934 earthquake to accommodate a change in grade.

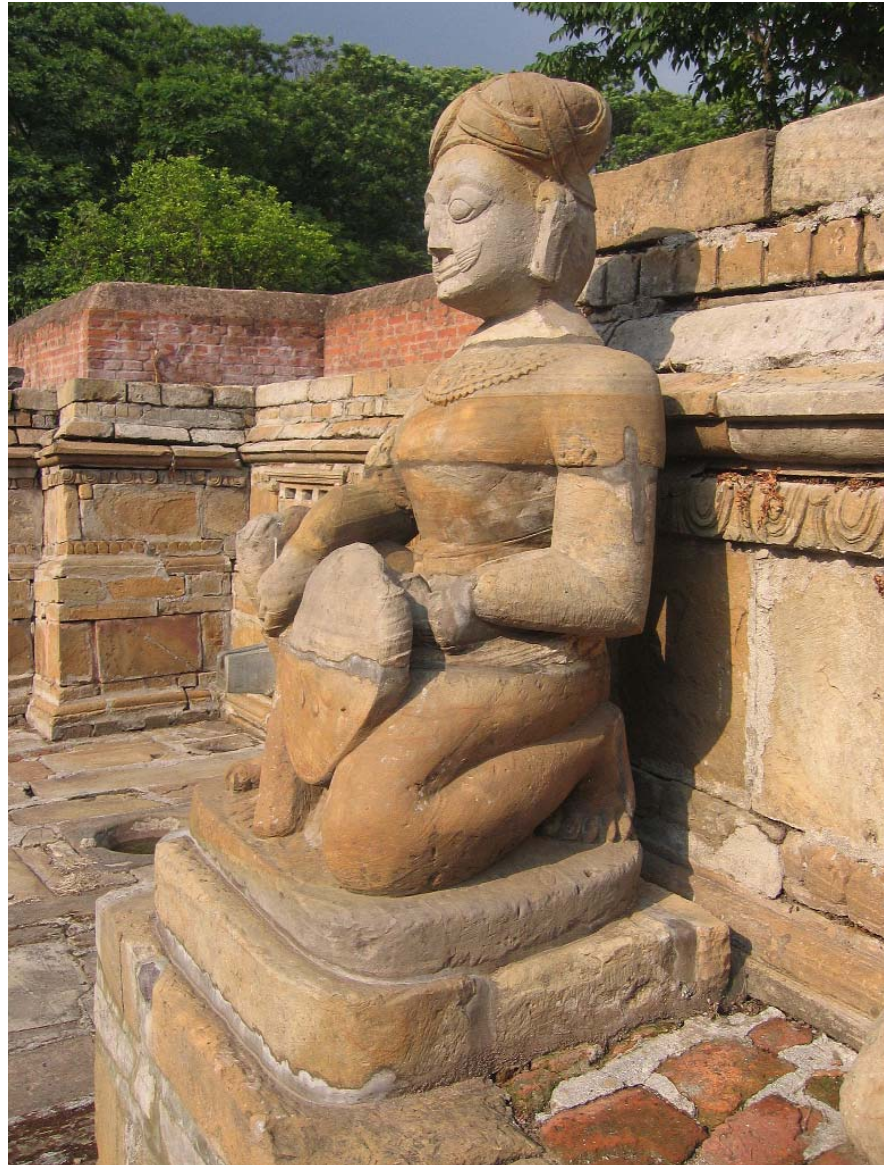
Photograph, May, 2006



Tap and Votive Images at the East Terrace of the Tank

A traditional stone tap was the water source of for the tank. A Licchavi period image of Vishvarup Vishnu, now embedded in the brick retaining wall, is still actively worshiped.

Photograph, May, 2006



Guardian figure

Recent repointing of this figure characterizes the typical nature of repair where Portland cement appears to have been used.

Photograph, May, 2006



Stone spout

Waterflow at the tank's spout has been interrupted for many years due to an acute water shortages and damage to the historic supply sources. Above the spout is a stone image of Ganga, flanked by two Malla period inscriptions.

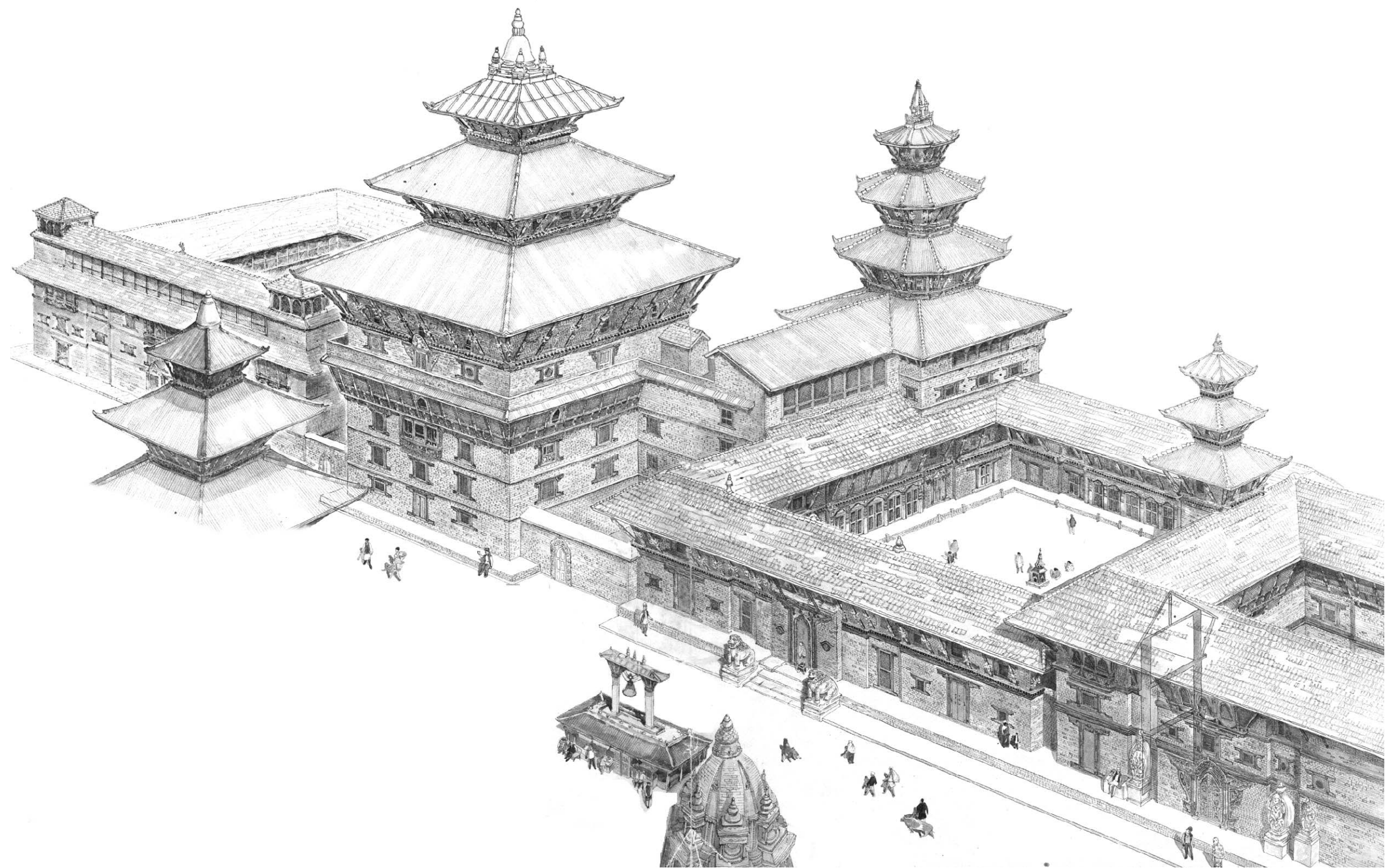
Photograph, May, 2006



Relief carving

These genre scenes are unique to the carved stone pavilion of the Bhandarkhal Tank. Note the use of Portland cement pointing.

Photograph, May 2006



Axonometric View of the Palace Complex

From left to right:

Keshav Narayan Cok, Degutale Temple, Taleju Temple, Mul
Cok with the bell in front, Taleju Temple, Sundari Cok.

Survey by the Nippon Institute of Technology, December, 1977

MUL COK & NASAL COK

CONSTRUCTED BY SRINIVASA MALLA 1666–1671

Preliminary Remarks

Mul Cok (Nepali for “main court”) is almost twice as large as Sundari Cok measuring approximately 30 meters by 30 meters and consists of two story wings punctuated by higher temple towers dedicated to various forms of the tutelary goddess of the Malla kings. Central ground floor timber arcades mark the east, west, and north courtyard elevations while the south wing contains a main shrine marked by a gilded repoussé door and tympanum flanked by large gilt copper personifications of the holy rivers Ganga and Yamuna. Carved windows and doors arranged symmetrically about the central axis of each façade complete the composition of each elevation. At the center of the tile paved courtyard is an open air shrine marked by a gilt repoussé canopy. The east garden-facing elevation lacks the richly carved timber elements of the courtyard and west facing elevations. With the exception of the east elevation, the late 20th century roof structure is supported by an array of historic and recent carved roof struts.

The construction of Mul Cok in 1666 was part of a campaign to renew and renovate the whole of the Patan Royal Palace Complex and most certainly rests on older foundations. The imposing Degutale Temple to the north of Mul Cok’s north wing was rebuilt at the same time and the practice of celebrating the Dasain sacrifices was established in the courtyard with the construction of another Taleju shrine in the south wing. The images of Ganga and Yamuna may date to an earlier reign and correspond to similar images that flank the ground floor shrines at the Mul Coks of the Bhaktapur and Kathmandu royal palaces. The chief Taleju shrine is a rooftop temple located at the northeast corner of the quadrangle and was consecrated in 1671. The now forgotten Yantaju, marked by the gilt copper canopy at the center of the court, was also established by Srinivasa as a companion deity to Taleju.

Mul Cok reveals evidence of later continued votive offerings in addition to 19th and 20th century embellishments. Most important among these is the renovated main entry which was altered by Jagat Shamshere Rana circa 1860 to celebrate the rice feeding ceremony of his son. Based on historic photographs half of the west wing, the northwest corner and the east wing sustained considerable damage in the earthquake of 1934. It was at this time that the roofs were reconstructed using modern flat terracotta roof tiles.

To the north of Mul Cok beyond an early 20th wing is a smaller rectangular court that is bound on the west by the Degutale temple tower and to the north by Keshav Narayan Cok. Currently unused except as a passage to Patan Museum administrative offices located in the so-called “kitchen wing” at the south, Nasal Cok was bound by a now lost east wing structure that survived as recently as 1980.



Entrance to Taleju Shrine at Mul Cok
Photograph, May, 2006



Mul Cok courtyard looking north
Reconstruction of the entire roof structure is recommended.
Photograph, May, 2006



Nasal Cok looking south
Assessment of roof is required to determine if reconstruction is recommended.
Photograph, May, 2006

Existing Conditions

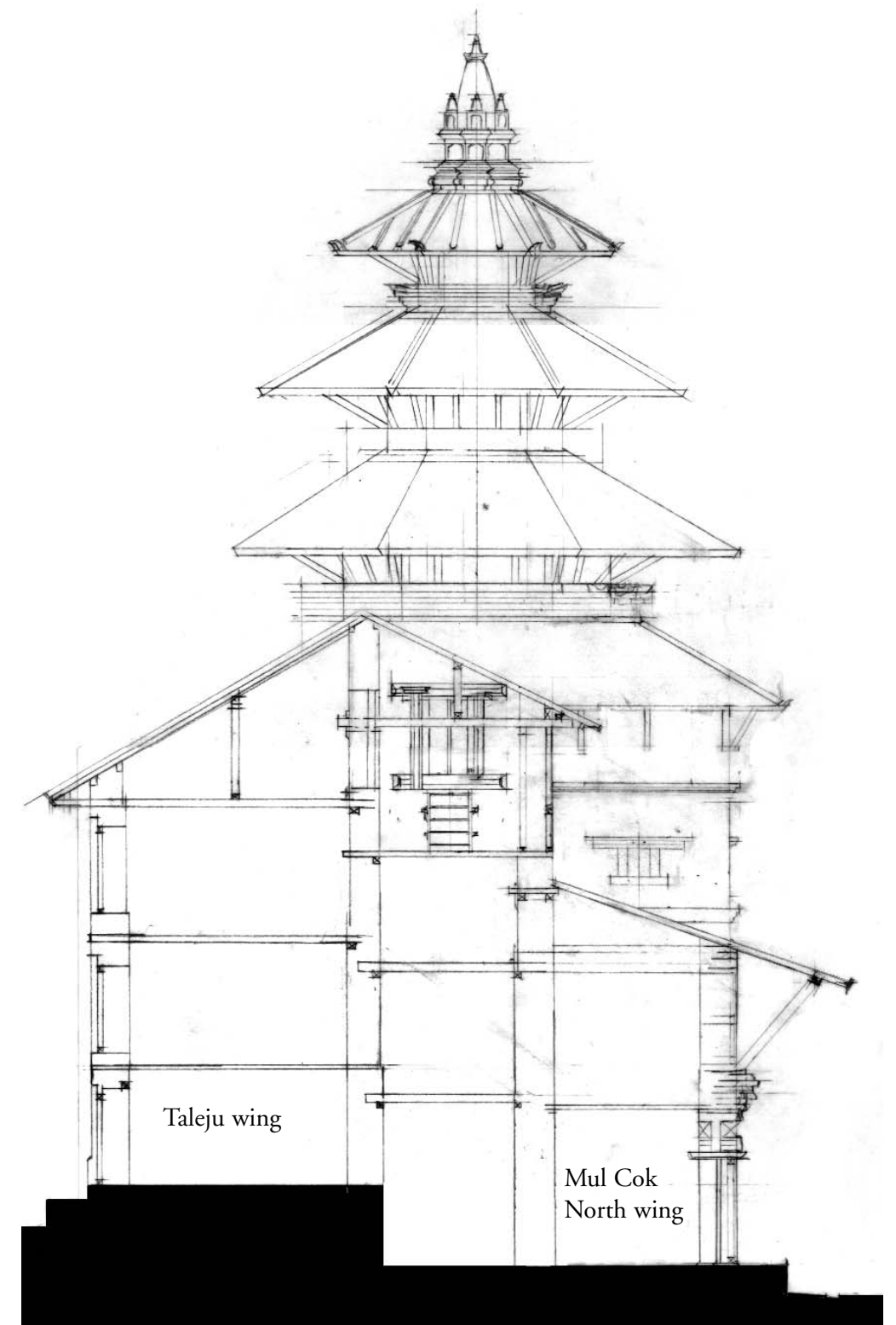
As in Sundari Cok the roof of Mul Cok is in poor condition and in urgent need of repair. Only four rooms on the ground floor level are presently used for ritual purposes. One room of the first floor level which had been used for tantric rituals (*Vidyapith*) has been closed for about 20 years since ritual obligations there became obsolete. The remaining rooms have been largely neglected and unused for a generation. Typical post-1934 earthquake reconstruction included the use of non-historic pan tiles, incorrect widely spaced rafters and ceiling joists, and the lack of any attempt to accurately reconstruct non-public garden facades. While the courtyard contains superb historic roof struts most are missing arms and attributes and many have been replaced with inferior facsimiles. The garden façade displays a patchwork of a variety of brick sizes that document successive repairs since the 1934 earthquake.

Conservation and Restoration

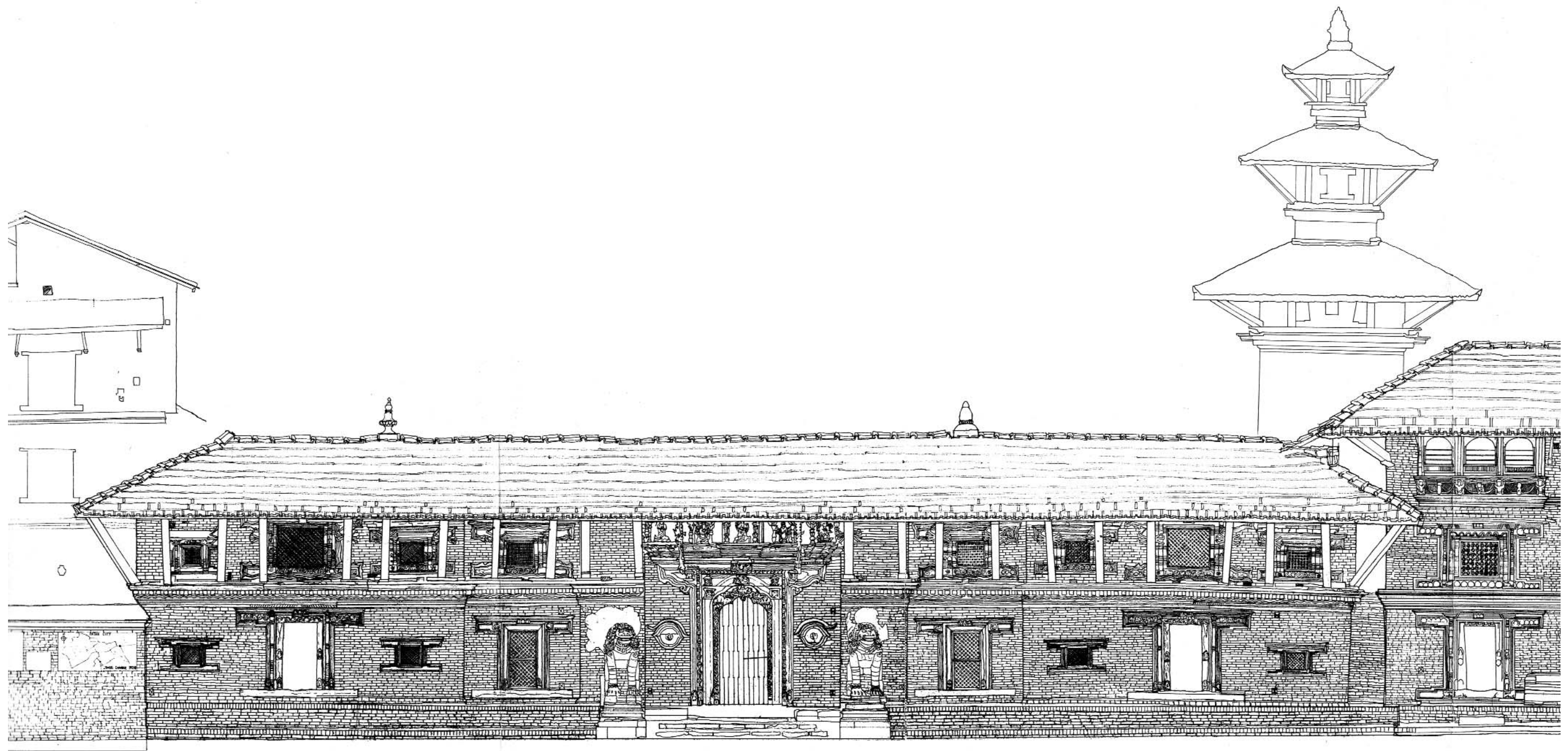
Any conservation program must include the complete rebuilding of the roof structure and cover. As in Sundari Cok the mission is of the opinion that a restored roof should include historically accurate rafter spacing and a traditional mud bed and correct historical tile roof cover. While the south “kitchen wing” of Nasal Cok appears to be in relatively stable condition its roof structure and cover need to be studied to determine whether there too reconstruction is required.

The oldest historic photographs document only four carved struts flanking the main entrance to the courtyard. It would appear that the remaining plain struts were replaced with inferior carved struts during the renovations in honor of King Mahendra’s coronation in 1955. While cleaning timber elements and the replacement of missing lacunae is recommended, further research is required to determine the iconographic program of the whole and the appropriateness of replacing low quality and erroneous iconographic carvings with new carvings.

Metal conservation and restoration measures for the gilt repoussé figures of Ganga and Yamuna and the vandalized tympanum need to be studied with the aim to develop strategies for the repair of damage and the possible replacement of missing elements.



N-S section through Taleju wing and Mul Cok, North wing
Rooms in the Taleju wing will provide additional exhibition space
Drawing Suresh Shrestha, 1997



Principal facade of Mul Cok facing the Darbar Square
Existing conditions
Survey by the Nippon Institute of Technology, December, 1977

0 1 2 3 4 5 meters

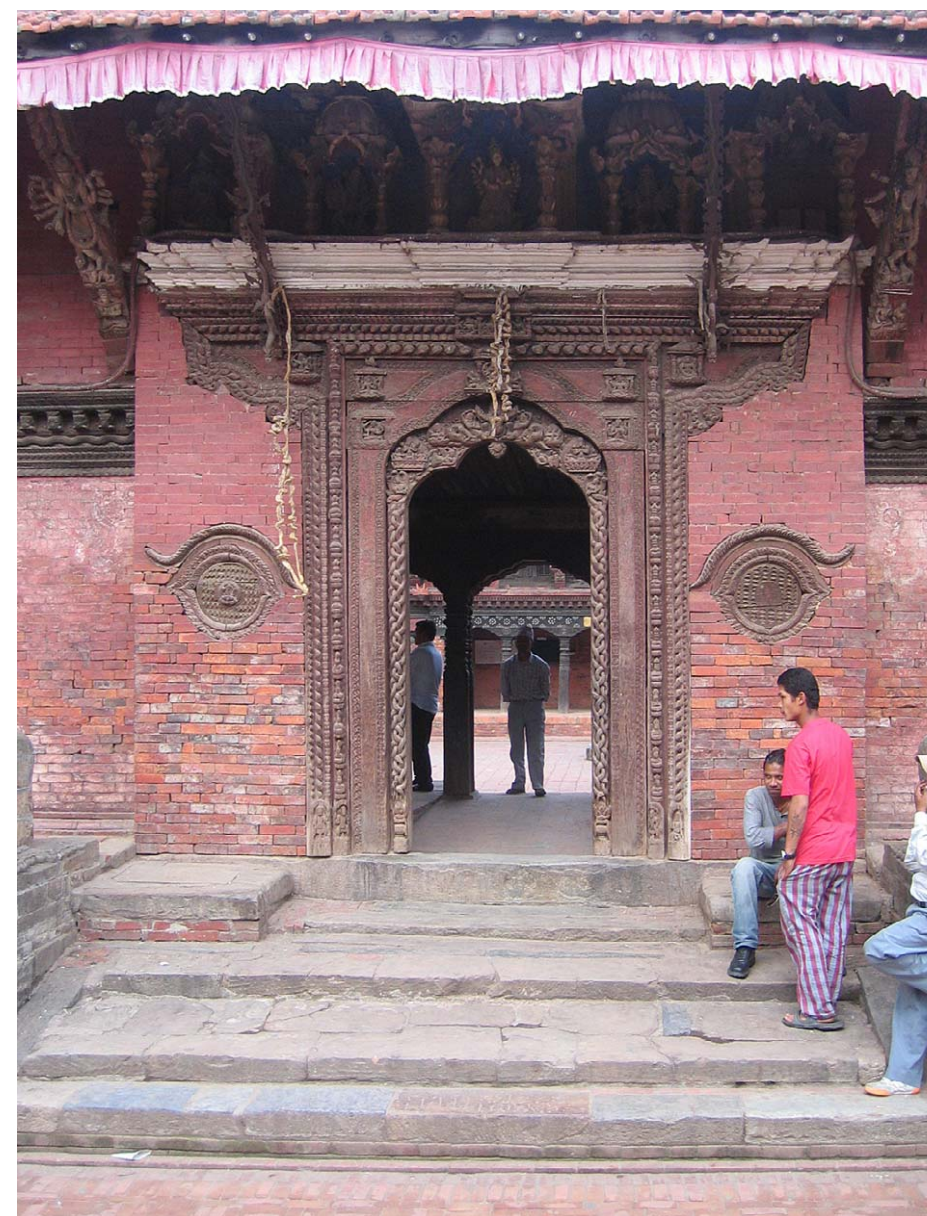


Principal facade of Mul Cok

Till the 1920s Mul Cok's roof was still covered with the traditional roof tiles laid in a mud bed. Other historic photographs attest to a number of

renovations: during the 1930s the roof cover was replaced with corrugated metal, and after the 1934 earthquake it was covered with large modern tiles.

Photograph by Perceval Landon, 1922



Main gate to Mul Cok

This large door dates from a renovation by Jagat Shamshere Rana in honor of his son's rice feeding ceremony, circa 1860s.

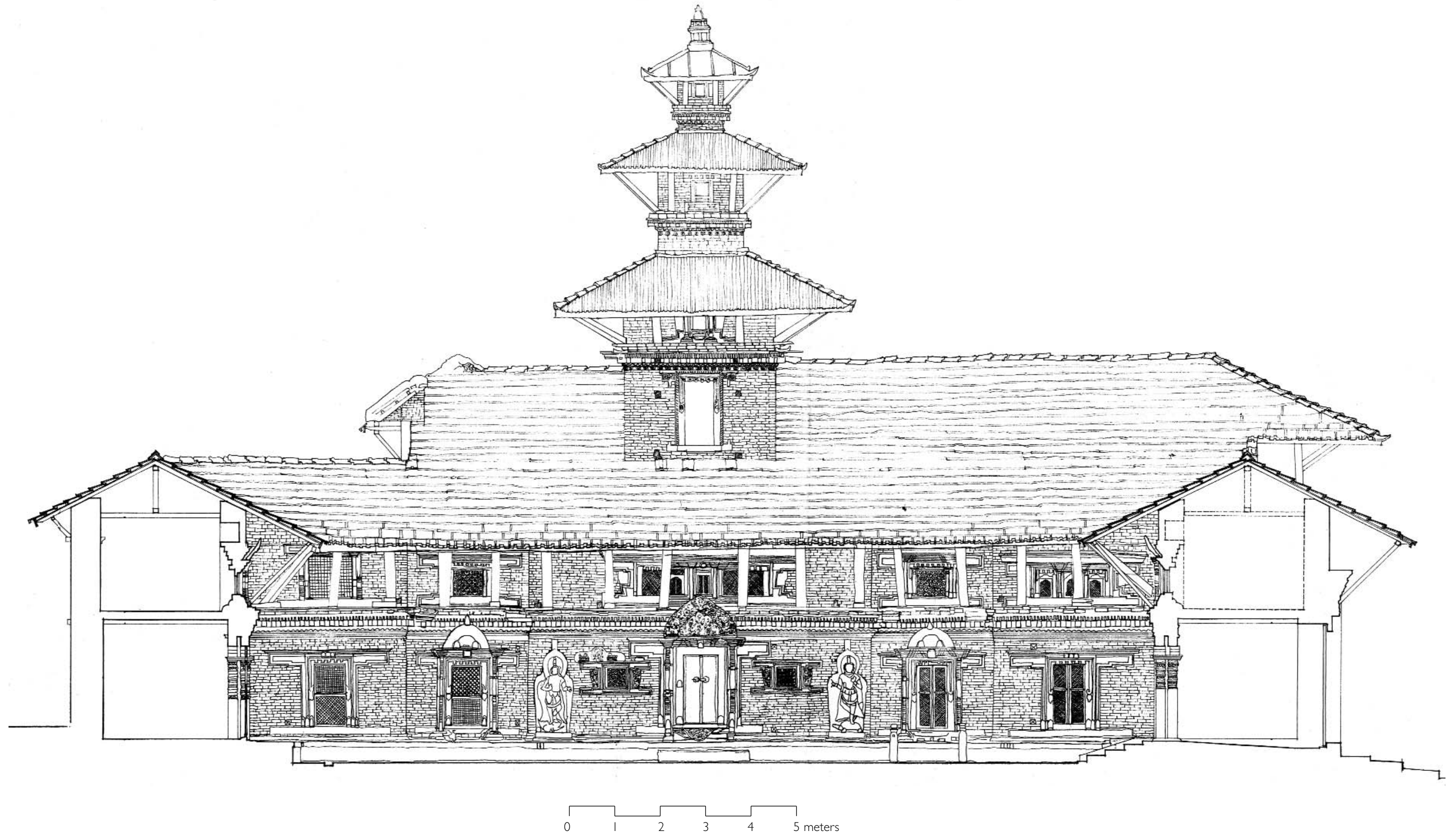
Photograph, May, 2006



Mul Cok courtyard looking west
Photograph by Stanislav Klimek, October, 2006



Mul Cok courtyard looking north
Photograph by Stanislav Klimek, October, 2006



Mul Cok - courtyard facade looking south
Existing conditions
Survey by the Nippon Institute of Technology,
December, 1977



Mul Cok courtyard looking south
Photograph by Stanislav Klimek, October, 2006



Small niche in the left door jamb

The deity that was once housed in this niche cannot be clearly identified in the historic photo on the right.

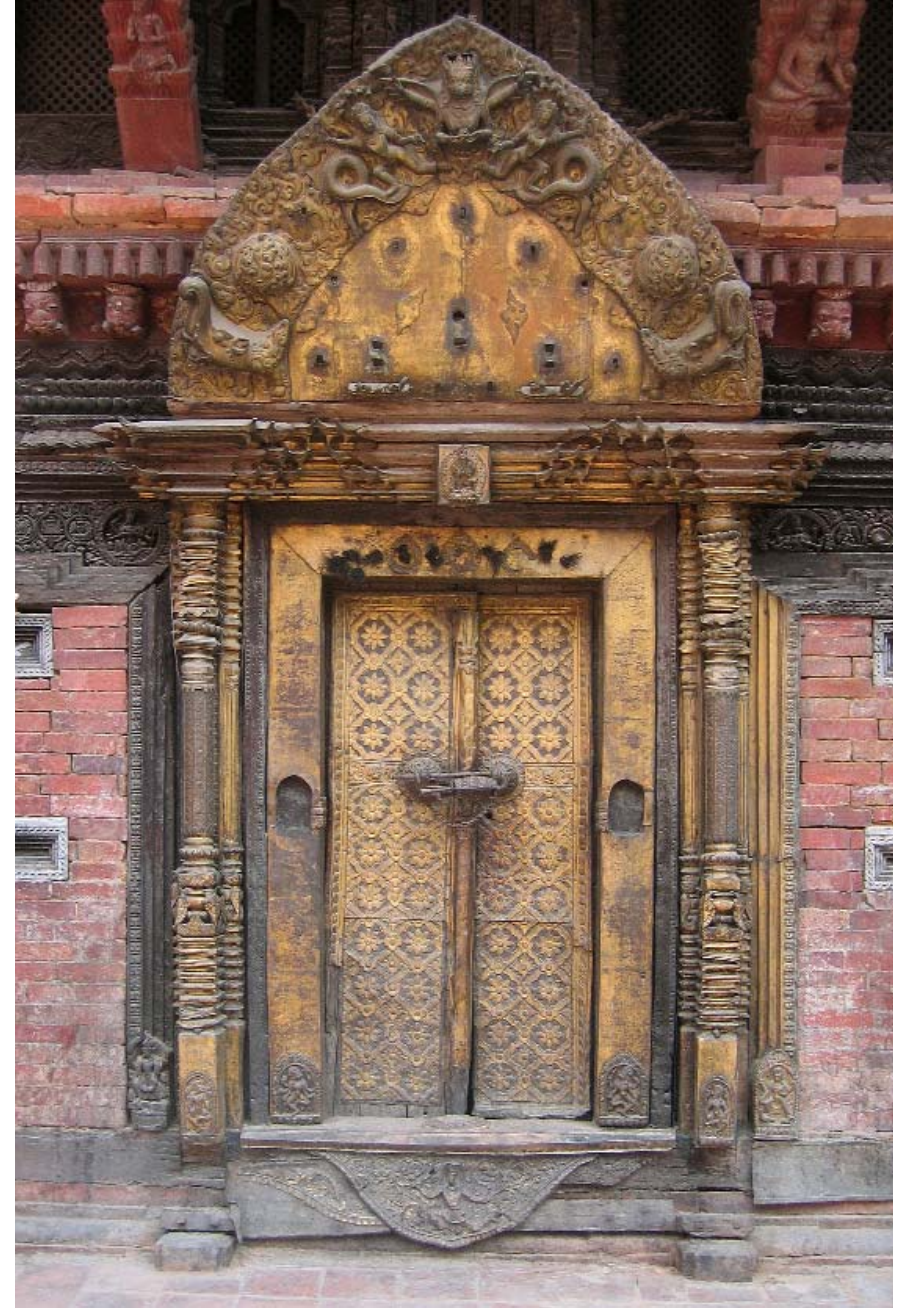
Photograph, May, 2006



Entrance to the Taleju Shrine in 1962

Although the photograph is not very clear it appears that the sculptures and door details were intact.

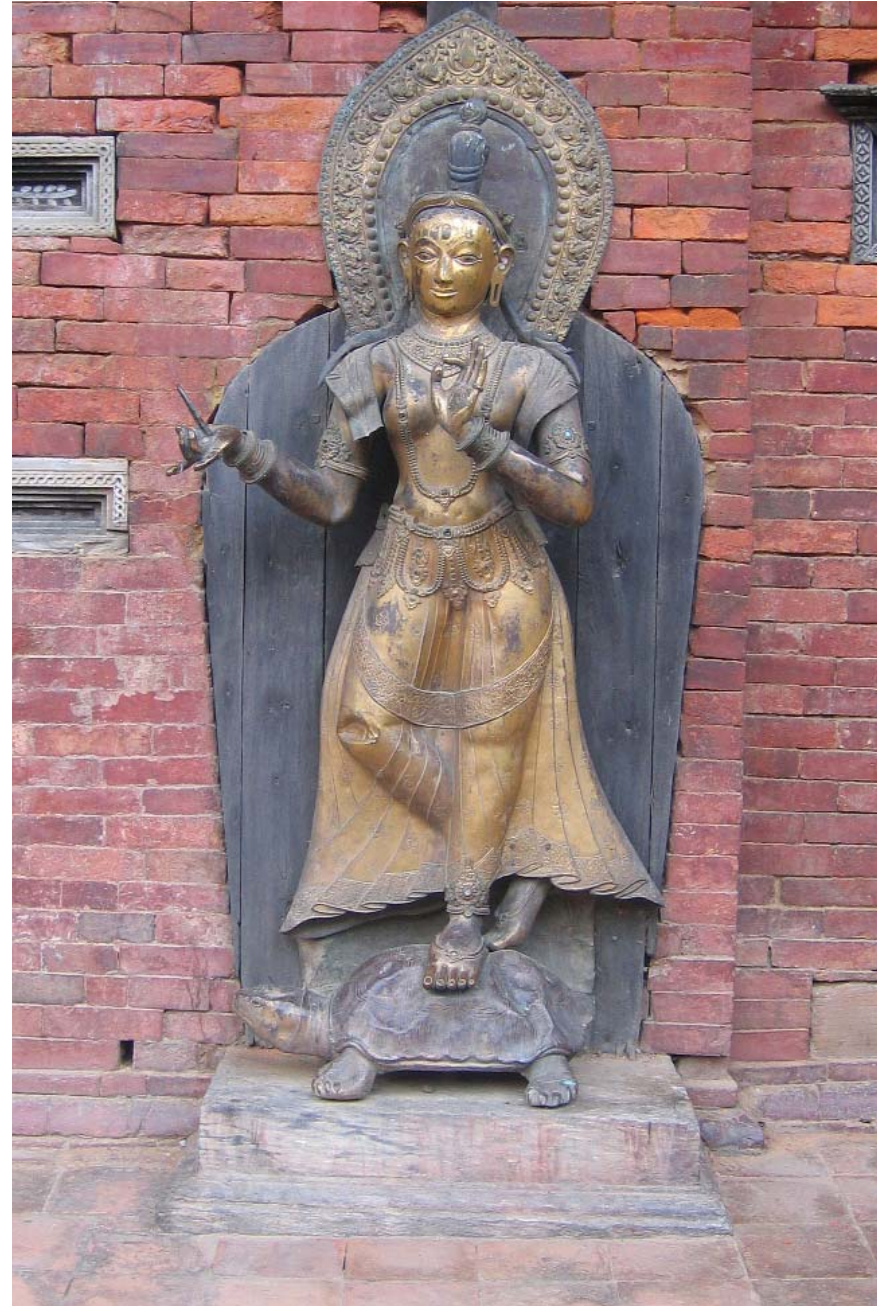
Photograph by Ranajit Gupta, 1962



Entrance to the Taleju Shrine in 2006

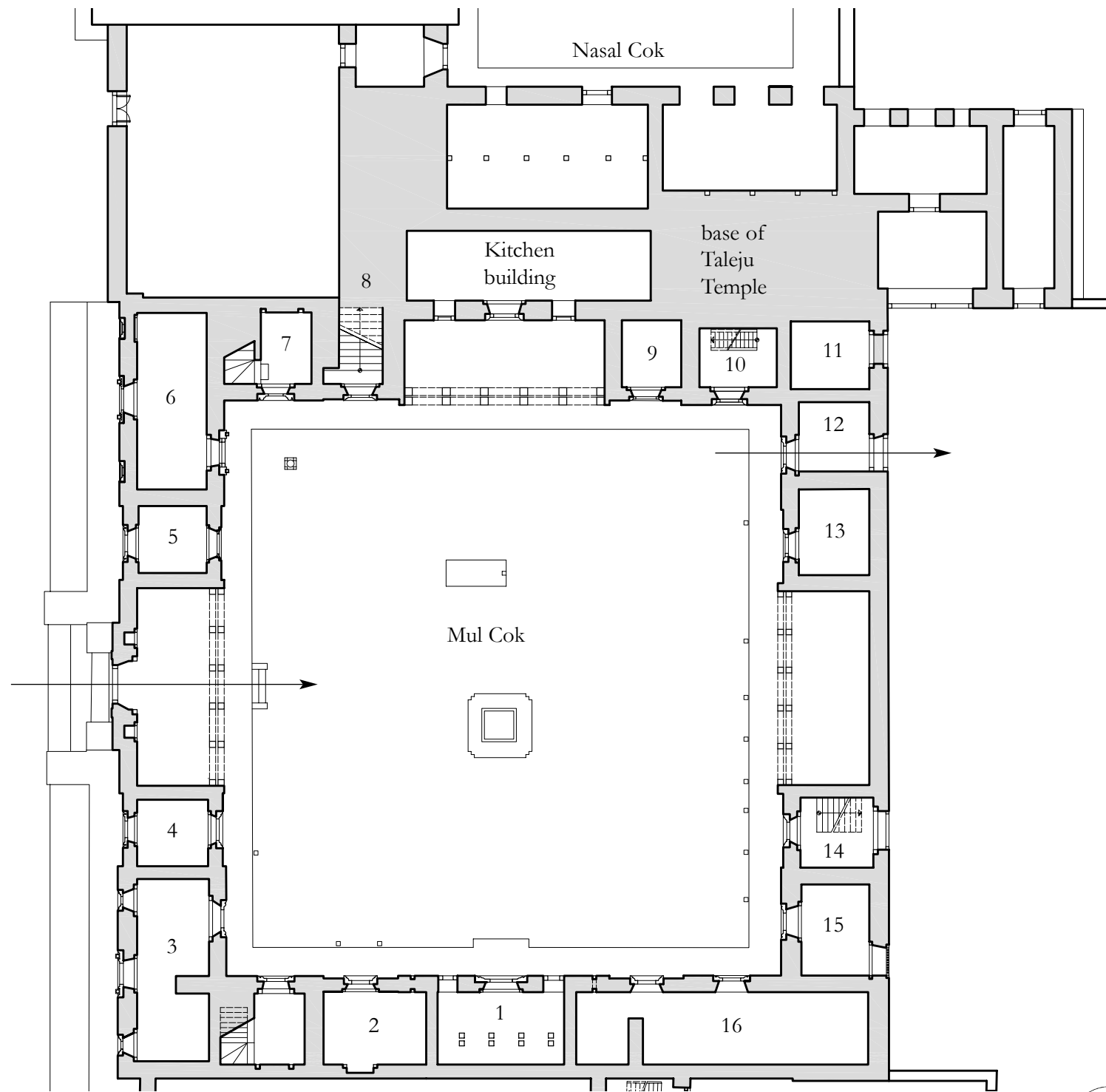
The central panel of the *toran* was stolen in the 1970s, many other parts have been broken off or damaged.

Photograph May, 2006



Ganga (on a makara) and Yamuna (on a tortoise) guarding the entrance to Taleju Shrine
 The river goddesses in anthropomorphic form were produced in gilded copper repoussée in the second half of the 17th century. Both images are damaged in many places and will require repair.
Photograph, May, 2006

The feet of Yamuna on the tortoise
 The tortoise has been dented and most of the gilding has been lost.
Photograph, May, 2006



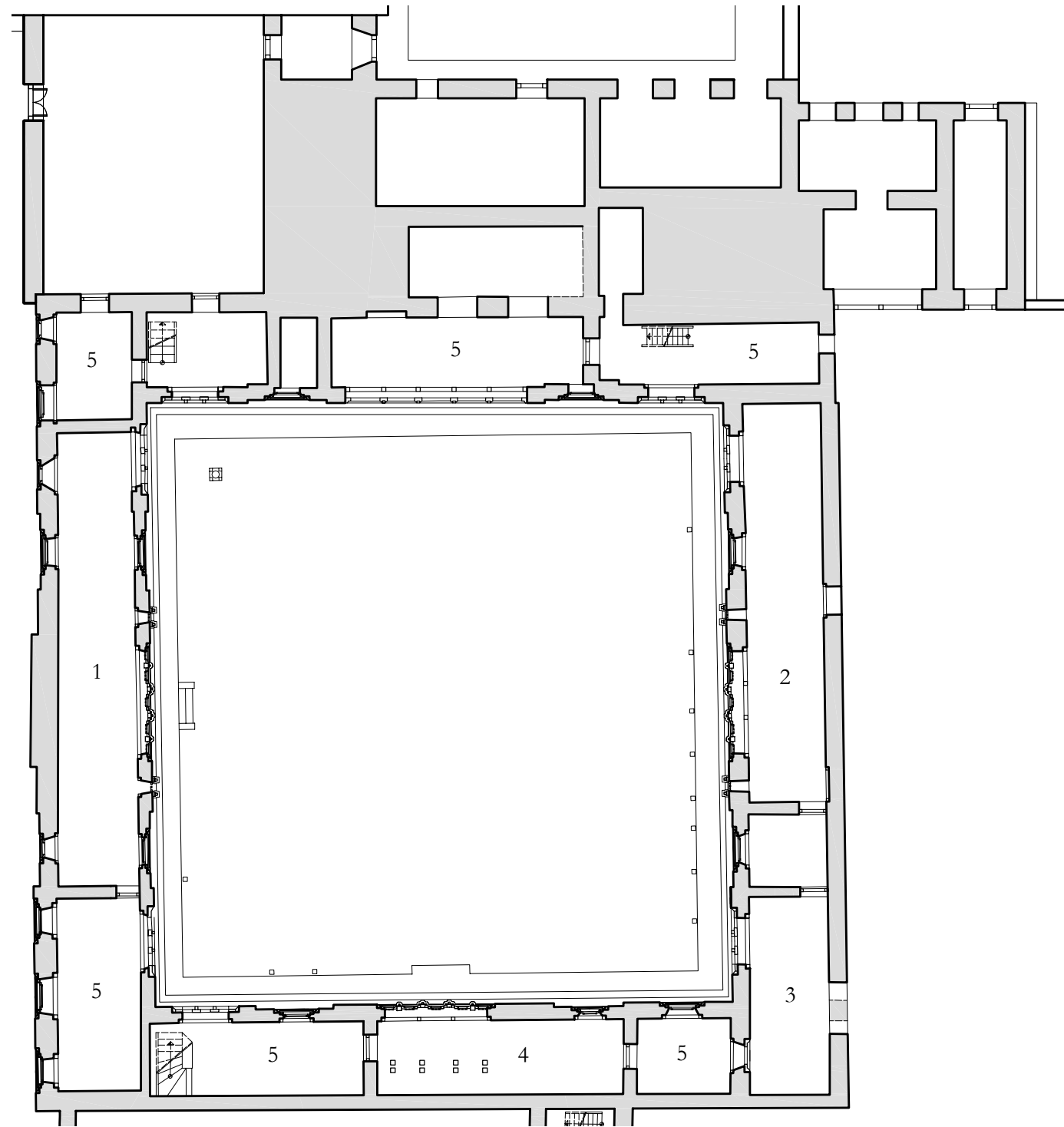
Mul Cok - Ground Floor plan

Existing conditions

Survey by the Nippon Institute of Technology, December, 1977

Drawing Anil Basukala, May 2006

- | | | |
|--------------------------------|---------------------------------|------------------------------------|
| 1 Taleju Shrine | 7 Muchen Agama | 13 Office room (Darbar herca adda) |
| 2 Jamarakotha | 8 Staircase to Taleju Temple | 14 staircase to Kumarikotha |
| 3 Store room | 9 Bhagavati Shrine | 15 store room |
| 4 Room for water and vermilion | 10 store room | 16 empty room |
| 5 Khadgakothe | 11 room with passage unknown | |
| 6 Guard room | 12 present passage to back yard | |



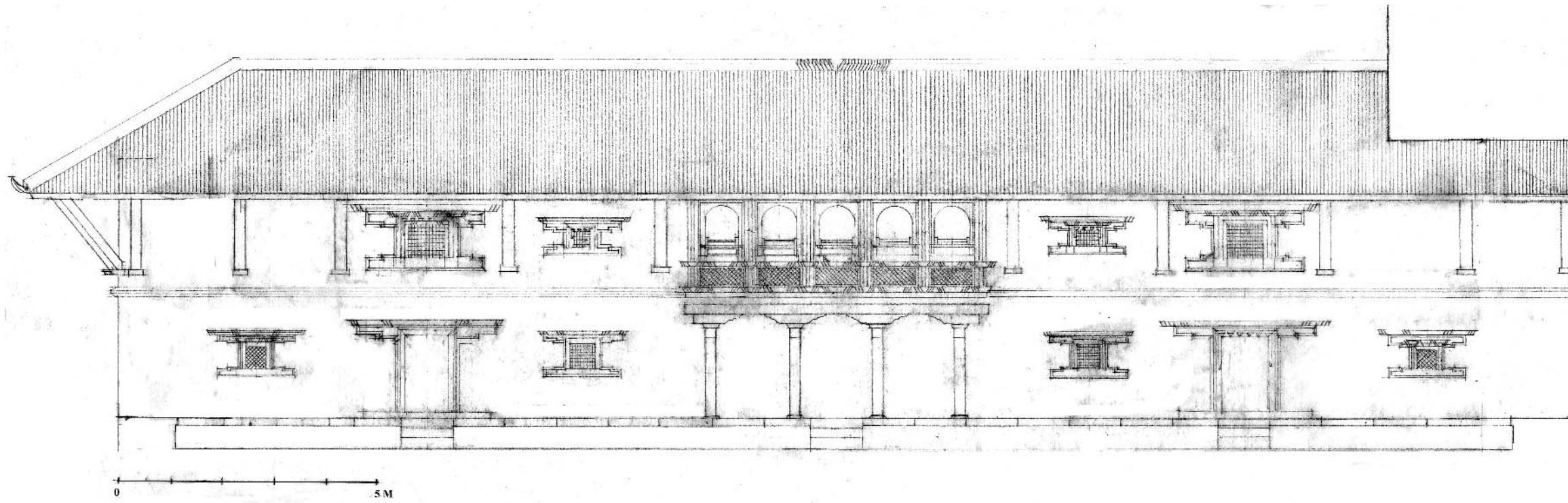
Mul Cok - First floor plan

Existing conditions

Survey by the Nippon Institute of Technology, December 1977

Drawing Anil Basukala, May, 2006

- | | |
|---|---|
| 1 Vidyapith of Rajupadhyaya priest:
room remains locked, worship
discontinued | 3 Kitchen for the Kumarikotha (used
once a year) |
| 2 Kumarikotha: the Kumari spends
the night of navami, the 9th day of
Dasain in this room. | 4 Empty room above the Taleju
shrine |
| | 5 Store rooms (undefined) |



Mul Cok - Garden Facade

above:

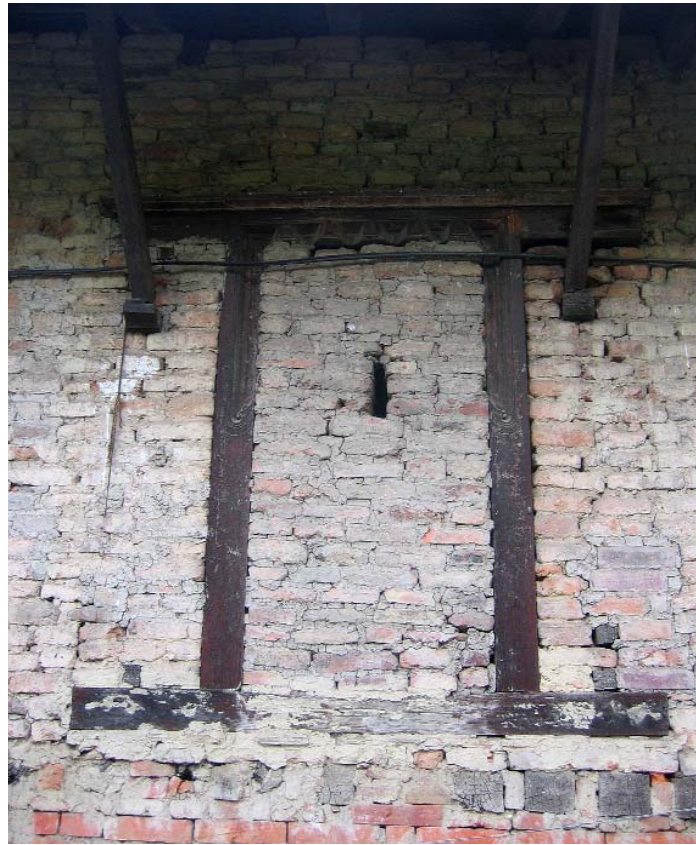
Hypothetical restored elevation. The assessment of appropriate design approaches for restoration and possible reconstruction will be a key strategy for planning.

Drawing, Bijay Basukala, April 2006

left:

Ongoing repairs are revealed in the variety of different bricks found in the rear wall. Two door frames on the first floor level represent vestiges of a former gallery which existed until the early 1970s.

Photograph, May, 2006



far left:
Door frame on first floor, East wing, garden facade
 This bricked up door might indicate that there was once a balcony or open arcade built against the East wing.



center left:
East wing roof framing
 The make-shift roof was built of salvaged timbers of different size and quality. Rafter spacing is much wider than historical examples, many joists have failed, and leaks occur just about everywhere.
Photograph, May, 2006



left:
North wing, storage room on the first floor
 17th century timber columns. These columns may have been salvaged from destroyed temples or lost palace structures during the 1934 earthquake. Research on their provenance and the creation of an inventory is recommended.
Photograph, May, 2006



far left and left:
Two doors on the Garden facade
 Until recently, the back courtyard was covered with debris which caused irreversible damage to the doors.
 A large variety of bricks found in this wall suggests that this part of the building has been repaired in patches until very recently. Some historic *daci-apa* bricks can be found only in isolated locations. They are certainly not found *in situ* but were reused from demolished walls.
Photograph, May, 2006



far left:

Struts on the principal facade

Almost all carved struts on the facade facing the Darbar Square are of inferior quality, probably produced for King Mahendra's coronation in 1955.

Photograph, May, 2006

left:

North-east corner of Mul Cok

Although of excellent artistic quality most roof struts are in a bad state of repairs. Many arms and attributes are missing. The poorly reconstructed roof (dating from the 1980s) and altered roof pitch necessitated shimming of most struts. Roof leaks can be seen in many places and the structure appears to be unsound.

Photograph, May, 2006



far left:

Door to the North wing

The two narrow columns and the multi-layered wooden frieze above are 19th century embellishments of the 17th century door. The door panels are carved in a style that is usually reserved for windows. The tympanum (*toran*) most probably also dates from the 17th century.

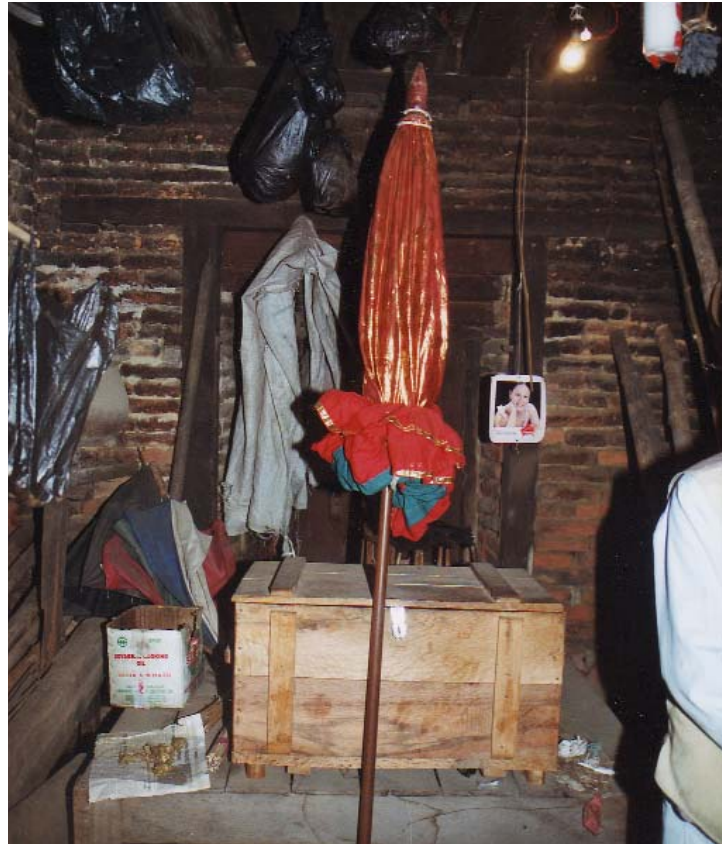
Photograph, May, 2006

far left:

Detail of the door seen on the left

The later added columns and frieze cover historic carvings of deities on the door jambs. Of 17 doors in the courtyard 5 have been altered in that manner.

Photograph, May, 2006



far left:

Khadgakotha

A wooden box holds the Malla period royal sword that is annually paraded through the city. Secure and fireproof storage for the sword should be established.

Photograph, May, 2006



left:

Ceiling joist, ground floor arcade

These 17th century joists confirm historically correct dimensions and spacing. It would appear that a now lost frieze existed between the brick and ceiling.

Photograph, May, 2006



far left:

Column in north arcade

Some of the column base stones have been either lost or were covered up by recent repairs. The timber column shows signs of advanced decay and will require repair.

Photograph, May, 2006



left:

Honor Guard assembling in Mul Cok

The guards meet in the courtyard to pick up the sword and take it for a procession of Matsyendranath.

Photograph, May, 2006



NORTH WING

CONSTRUCTED BY BAHADUR SHAH 1792

Preliminary Remarks

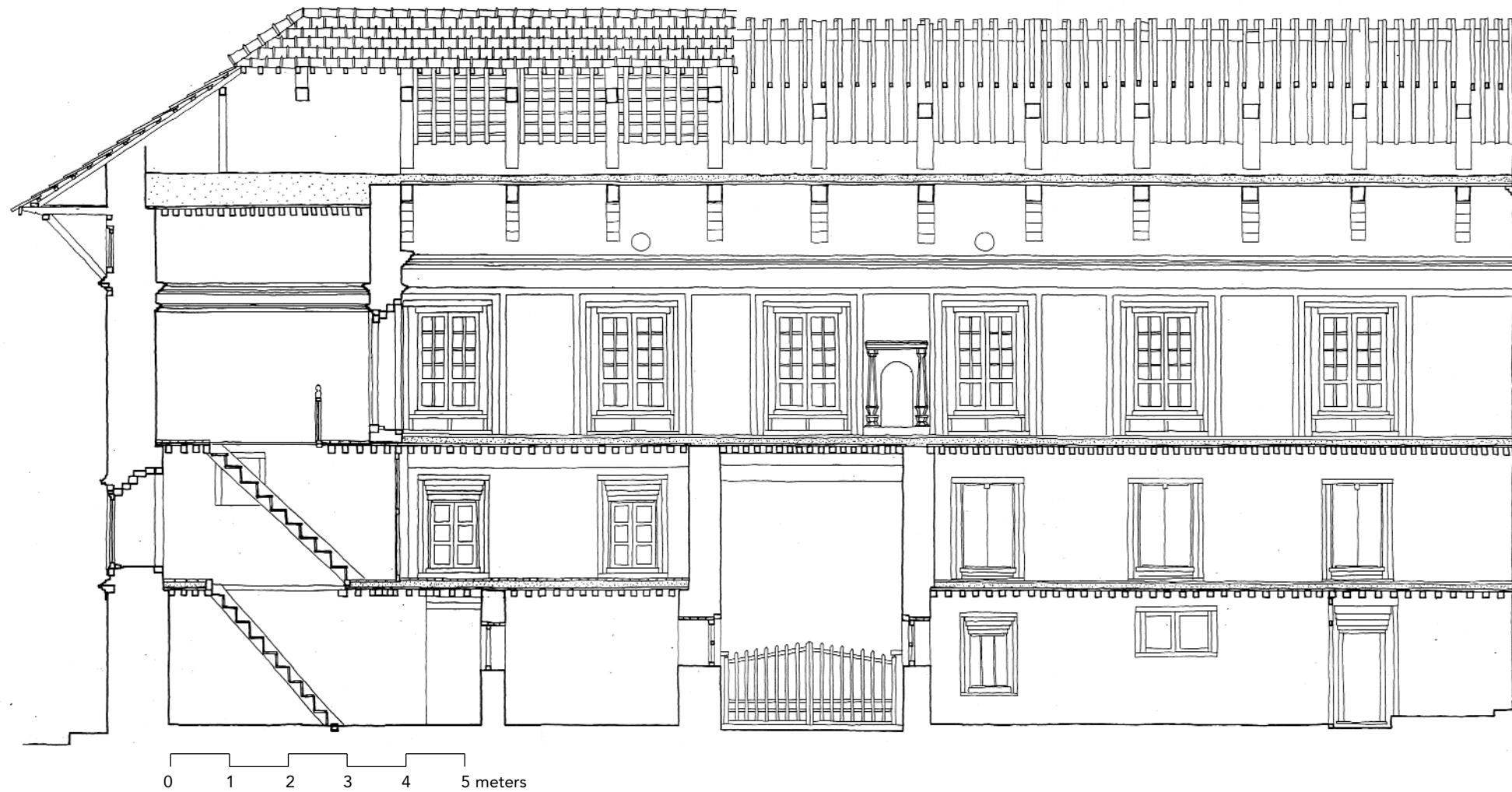
At the north end of the series of palace structures is a palace wing, a simple building block, that departs from the characteristic courtyard configuration of the others. Measuring approximately 25 meters by 7 meters, the building consists of two short stories, bisected by a two story passage, below a taller upper story reception hall (Nepali *baithak*). The main stair resembles a ladder and is contained in a space at the north of the building apart from the upper story hall. Timber trusses constitute the roof structure above a curiously painted ceiling.

The North Wing is composed of masonry load bearing walls and timber openings like the adjacent wings but it differs from these both stylistically and spatially. While the two interior volumes of the lower stories resemble the proportion and height of earlier traditional building interiors with either masonry piers or rows of columns halving their depth, the upper floor offers a large single-span space. The composition of the façade is governed by regularized fenestration around a two story high “elephant gate” at the center. The traditional palate of brick, timber, and tile is augmented by the addition of lime plaster surrounds at the upper story windows.

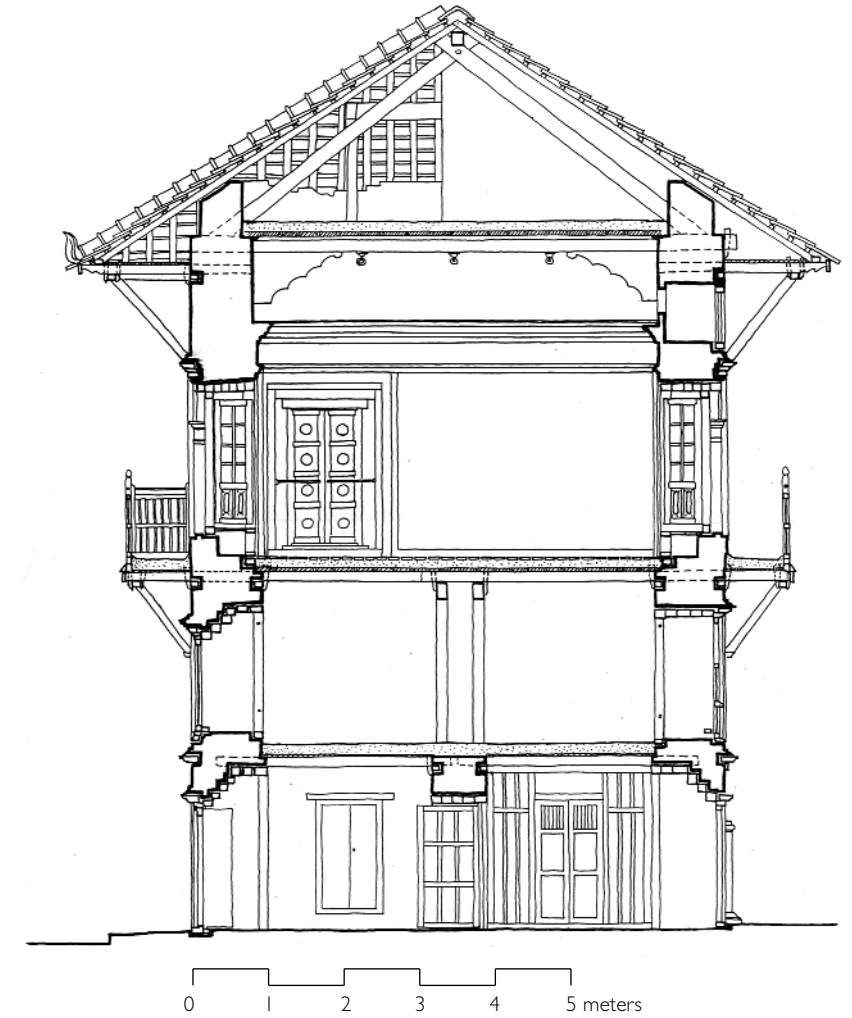
There are no known documents or inscriptions to date the building but research by Theophile and Gutschow proposes a date at the turn of the 18th century as the achievement of Bahadur Shah. This ruler might have built the structure after his return from a documented stay in Benares where he was undoubtedly exposed to the Anglo-Indian idiom favored by North Indian Nawabs. (see: Gutschow, Niels and Theophile, Erich, 1995, *Conservation of Patan Darbar North Wing*, Patan Conservation and Development Program, UDLE- GTZ, Kathmandu, Nepal). With the creation of a large-scale reception hall on the upper floor, their research suggests, the North Wing may be the first building in Nepal with a high-ceiling, large-span interior inspired by Anglo-Indian architecture. Oversized doors and windows, vertically oriented windows, and wood roof trusses were all part of this architectural vocabulary. Although the hall itself is quite grand in comparison to the more intimate Malla-period structures, access to the main hall by a ladder-stair recalls local traditions and simple interior arrangements. Additional research should include further archival work to locate any written evidence of a construction date and original use.

While the original use of the building is not clear it was later used as an armory. After the earthquake of 1934 it housed the Earthquake Loan Branch, a local office in charge of providing loans to those affected by the earthquake. In 1950 the building was leased to the Tripadma Vidyasrama School and since 1973 has been leased to Adarsha Kanya Niketan Girl's School and is now mostly used for storage.

The building remains largely underutilized. Adarsha Kanya Niketan Girl's school rents out part of the first floor to the Patan Rotary club and has claimed some storage space on the ground floor level. Half of the first floor and the upper level hall remain unused.



North Wing - longitudinal section looking east
 Existing conditions
 Survey by Gyanendra Joshi, December, 1993



North Wing - section looking south
 Existing conditions
 Survey by Gyanendra Joshi, December, 1993

Existing Conditions

In 1995 the German Urban Development Through Local Efforts Programme in partnership with the Lalitpur Municipality completed a restoration of the wing which included nominal roof repair and re-tiling, window and balcony repair, and repainting of the interiors. Modern pan tiles were used during roof repairs. The beams and ceiling of the main hall of the upper story were somewhat crudely repainted during an earlier campaign to improve the interior.

Conservation Issues

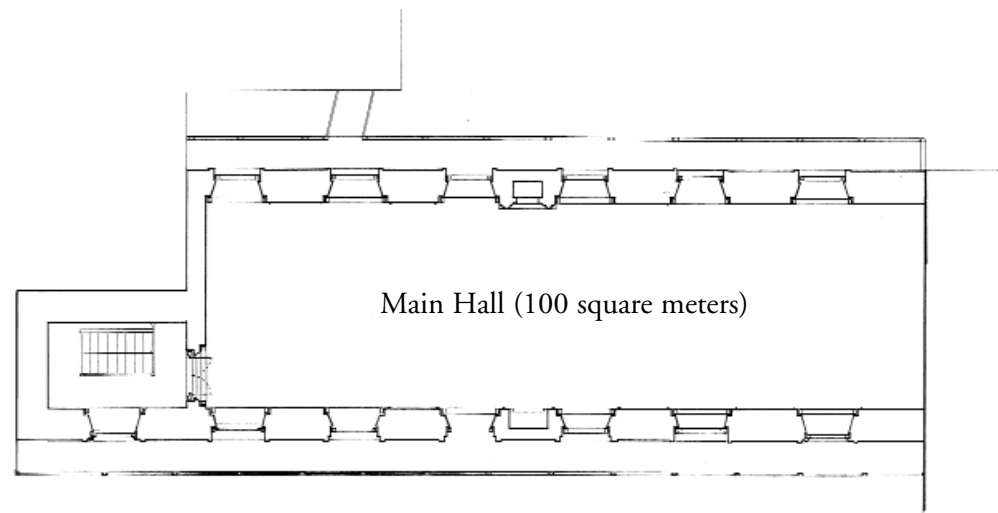
Apart from the later roof structure, the building appears to be largely intact in configuration and building detail. The roof structure is the principle conservation challenge of the structure. Again, as in Sundari Cok and Mul Cok, the poor repair of what is probably a 20th century roof structure raises the question of whether it should be restored to an earlier more authentic configuration or repaired and rebuilt as is.

Determining the desirability of restoring a traditional tile roof cover is a significant conservation issue. Restoration of a traditional roof cover would relate it to the adjacent Keshav Narayan Cok but structural analysis of the timber roof trusses is required to determine if reinforcing or replacement is required to bear the load of a restored historic tile and mud bed roof. While much of the interior plaster finishes of the main hall appear to have been repaired over time a surviving sgraffito frieze at the top of the stair hall provides evidence of original decorative finishes. Treatment of this frieze offers an opportunity to develop conservation and restoration methods for application in other late 18th and early 19th century buildings where such finishes may survive.

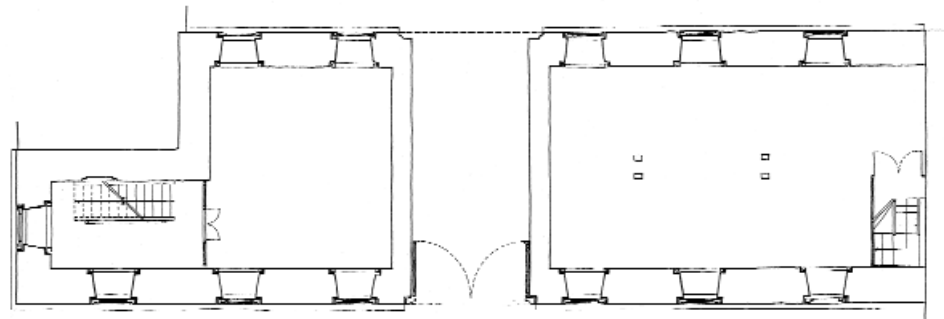
Recommended Research, Documentation, & Study

The presence of a sgraffito frieze at the interior and the spare use of plaster surrounds to delineate the openings of the upper story represent an early use of lime plaster as a decorative material. The use of lime plaster here not only presages a later preference for the material but firmly places this building in relation to North Indian architectural traditions. Further research is required to explore the question of the broader context of other early Shah buildings in the Valley. Of particular interest for buildings of this period is the subject of a hybrid architecture that shows inspiration from the stylistic motifs of a North Indian idiom while drawing on local building traditions.

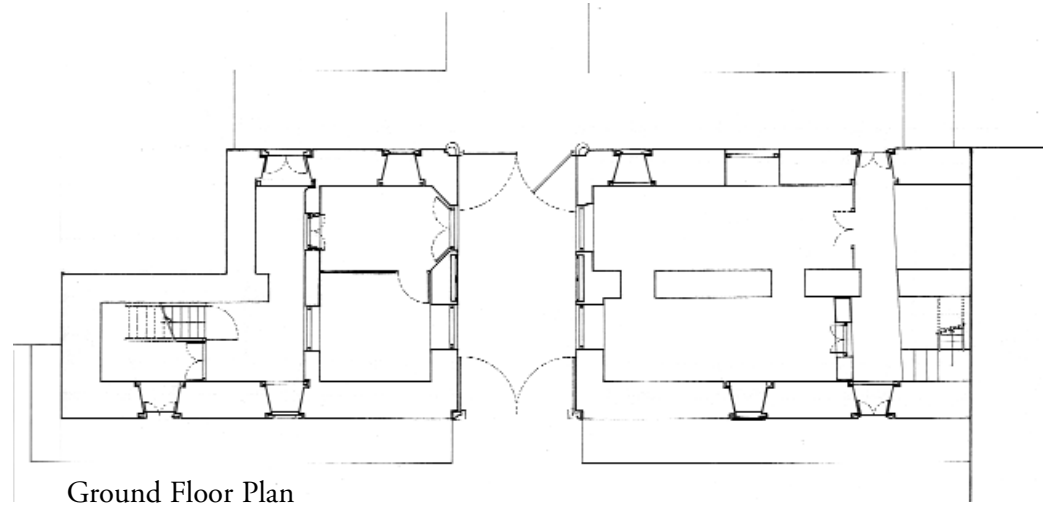
The presence of the so-called “elephant gate” at the ground floor may indicate a public ceremonial purpose for the building. Further research might not only reveal this ceremonial use but may also indicate a relationship to the use and configuration of the Malla period gardens that back the palace buildings to the east.



Second Floor Plan

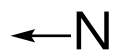


First Floor Plan



Ground Floor Plan

0 2 4 6 8 10 meters



North Wing - plans
Existing conditions
December, 1993



North Wing - main hall on the top floor
This is the first building in Nepal featuring a room of more than 5 meters in width. The roof incorporates heavy timber trusses.
Photograph, May, 2006



far left:
North Wing - storage room on first floor level
 Most the North Wing's rooms are used for the storage of broken furniture.

left:
North Wing - frieze in the staircase to the hall
Photograph, May, 2006



North wing - east facade
 This part of the building retains most of its original form. Repairs of doors, windows, balcony, and roof were carried out with the support of the German funded Urban Development through Local Efforts Programme in 1995.
Photograph, May, 2006



**Historic view of Bhashmeshvara Mandir,
Sundari Cok, and the south-west-corner of the
Court Building**

The Court Building originally featured a timber
balcony on the 2nd floor level similar to the one
of the North Wing.

Photo Kurt Böck, 1899

Museum für Völkerkunde, Vienna

COURT BUILDING & KOT PATI

ATTRIBUTED TO BHIMSEN THAPA CA 1820, ARCADED FAÇADE CA 1910

Preliminary Remarks

Located at the southeast corner of Sundari Cok, the white stucco Court Building, along with the brick and timber Kot Pati, marks the southern edge of the Patan Royal Palace Complex. The Court Building is composed of two stories with a south-facing masonry arcade. The single story, single span Kot Pati extends approximately 70 meters to the southeast and may be coeval. Entry to the Court Building is marked by an imposing timber gate located at the south east leading into a self-contained stair tower.

While no inscriptional evidence exists to confirm the attribution, exact dating, and original use of the Court Building, the Kathmandu Valley Preservation Trust has established that it was likely constructed by Bhimsen Thapa in three-story form based on comparisons with buildings known to have been commissioned by this early prime minister. (see: Ranjitkar, Rohit and Theophile, Erich, 1999, unpublished study: *The Court Building, A Model Scheme for Architectural Conservation*, Kathmandu Valley Preservation Trust, Lalitpur, Nepal).

The building represents a more mature rendering of the Anglo-Indian idiom with fully plastered surfaces, strict geometrical arrangement of façade elements, and a verticality un-encountered in earlier buildings. Historic photographs document the existence of a third story that was composed of alternating Mughal style blind arches and large vertical shuttered windows. Above the cornice which supported the roof brackets was a series of shallow niches that contained figures rendered in sgraffito. The structure likely contained an open-span hall on the upper level that was not unlike that of the North Wing. The original masonry stair departs from the stair of the North Wing by creating a grand ascent to the upper levels.

The two-story masonry arcade that fronts the building was likely constructed around 1910 and replaced a wooden balcony similar to the balcony of the rear façade of the North Wing. The building acquired its current name after municipal courts were housed there. Most recently the building housed a local branch of the post office. After recent roof repairs the building remains unused.

The Kot Pati was likely originally intended as a resthouse for travelers. Once a long and open arcade the structure has now been divided up with makeshift doors and partitions to accommodate the presence of various vendors. As with the other buildings of the Complex, the Kot Pati's historical tile roof cover has been replaced with later flat pan tiles.





Comparative view of the pati today and around 1900

Today's shops offer mostly low-end garments and souvenirs and also house several tea shops and cheap snack bars.

Existing Conditions

Recent roof repairs have halted any deterioration that may have been caused by water infiltration but the use of the front arcade by salt traders has caused considerable damage to its historical lime finishes. A spectacular sgraffito frieze above the main entry is the only surviving example in the building of this decorative treatment but it too shows signs of deterioration. The original tiled masonry stair has been covered with a Portland cement finish. All rooms remain empty with the exception of the attic which is used by the police as sleeping quarters. Grade level to the north and south of the building appears to be about 50 cm higher than historic levels and has caused some damaging water infiltration at the base of the building.

The roof of the Kot Pati appears to be in poor condition. The occupation of the entire structure by vendors makes it difficult to assess its overall condition.

Conservation and Restoration

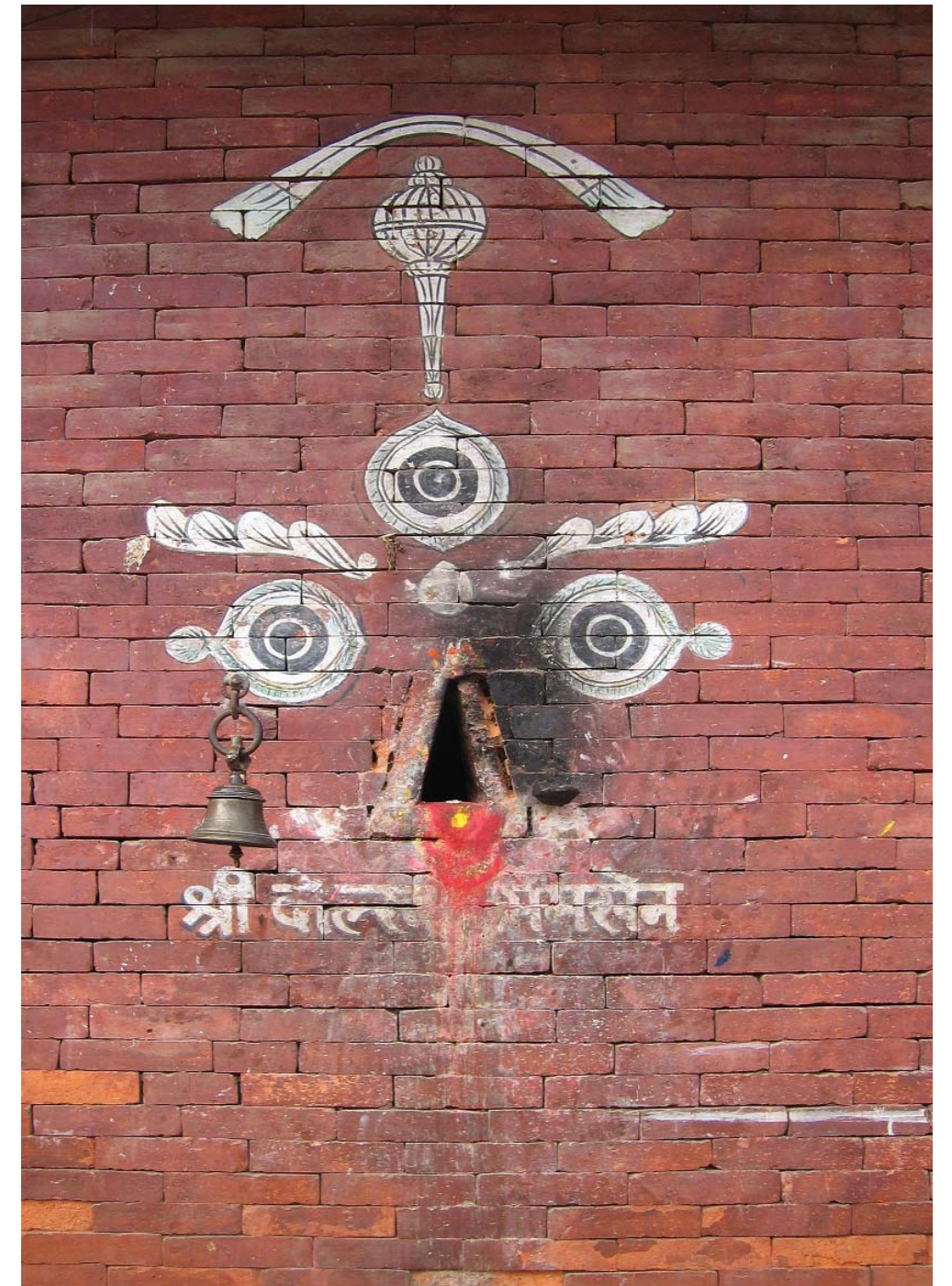
The absence of the original upper story of the Court Building greatly diminishes its urbanistic and formal function of marking the edge of the Palace Complex. The mission recommends the reconstruction of the original upper story and traditional tile roof cover. Similar early 19th century structures at the Hanuman Dhoka Palace in Kathmandu together with historic photographs need to be studied to develop appropriate details for reconstruction.

A recent Portland cement finish to the original masonry stair should be removed and the original tile should be restored and/or replaced with appropriate replacement tiles.

The destructive presence of salt sellers at the front arcade should be permanently prohibited in order to prevent further damage to historic lime finishes. The sole remaining example of sgraffito ornament needs to be conserved and restored. This and other examples of the technique should be studied for the recreation of such ornament on a reconstructed upper story.

The problem of a higher grade at the north and south of the building will need to be addressed to halt further water infiltration.

As with all of the structures of the Patan Royal Palace Complex, the restoration of a traditional roof cover for the Kot Pati is a main conservation issue and will need to be studied. Detailed documentation and study of the structure will be required to determine a comprehensive conservation strategy for the building.



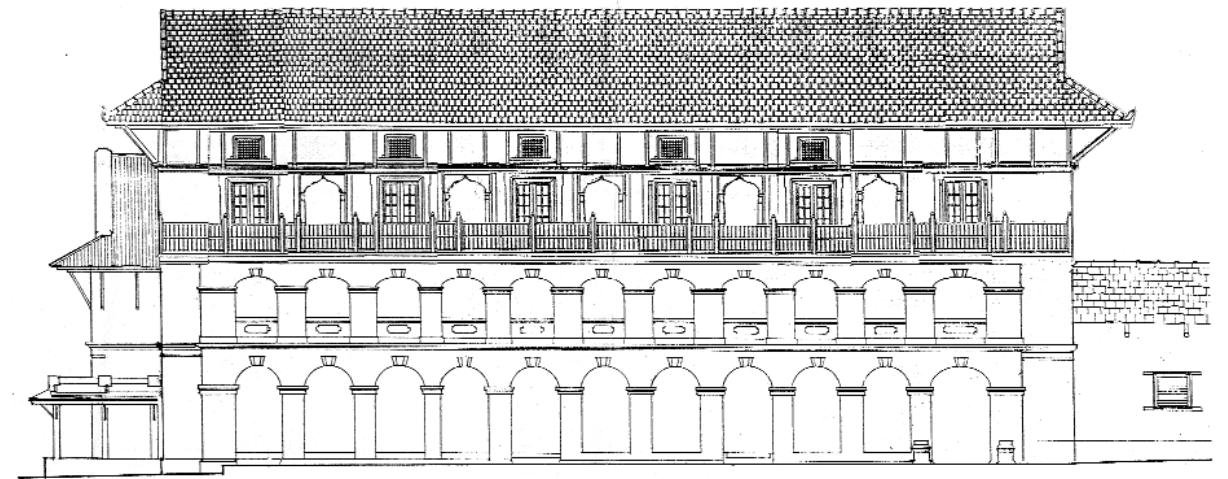
Detail of Kot Pati
Photograph, May, 2006



Early 20th century photograph of the Court Building

This photograph documents the original three story form. The masonry arcade was later added to the structure leaving only a small portion of the original balcony.

Photographer and date unknown



Court Building, south elevation, proposed reconstruction

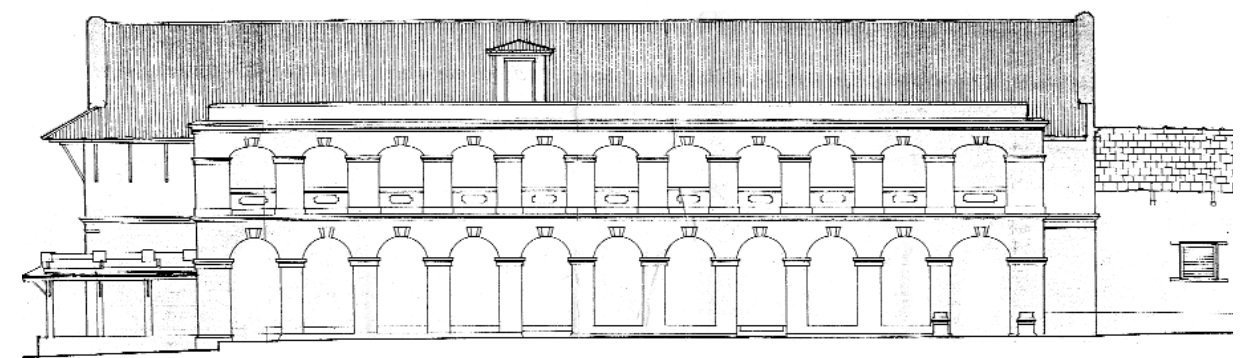
The reconstruction scheme includes the rebuilding of the lost upper story and balcony.



Court Building, view from South

The Court Building as it appears today with the recent roof repair completed by the Department of Archaeology. Hawkers occupy the lower level of the arcade.

Photograph, May, 2006



Court Building, south elevation, existing condition

The building lost its upper story during the 1934 earthquake and was not rebuilt.



View looking east toward the Court Building
Commercial encroachment at the south of Sundari Cok and the west of the Court Building.
All photographs on this page: May, 2006



South-west corner of the Court Building
Commercial encroachment.



Salt traders at the entrance to the Court Building
The presence of salt has caused extensive damage to the traditional lime-brick plaster finishes.



Sgraffito frieze above the main entry to the Court Building
A rare surviving example of sgraffito offers the opportunity to develop conservation and restoration methods for this decorative technique employed on early 19th century buildings.



Interior view of the main entry
The large scale of this doorway was a departure from the diminutive scale favored by traditional Newar builders. Note that the outside grade is higher than the threshold of the door.



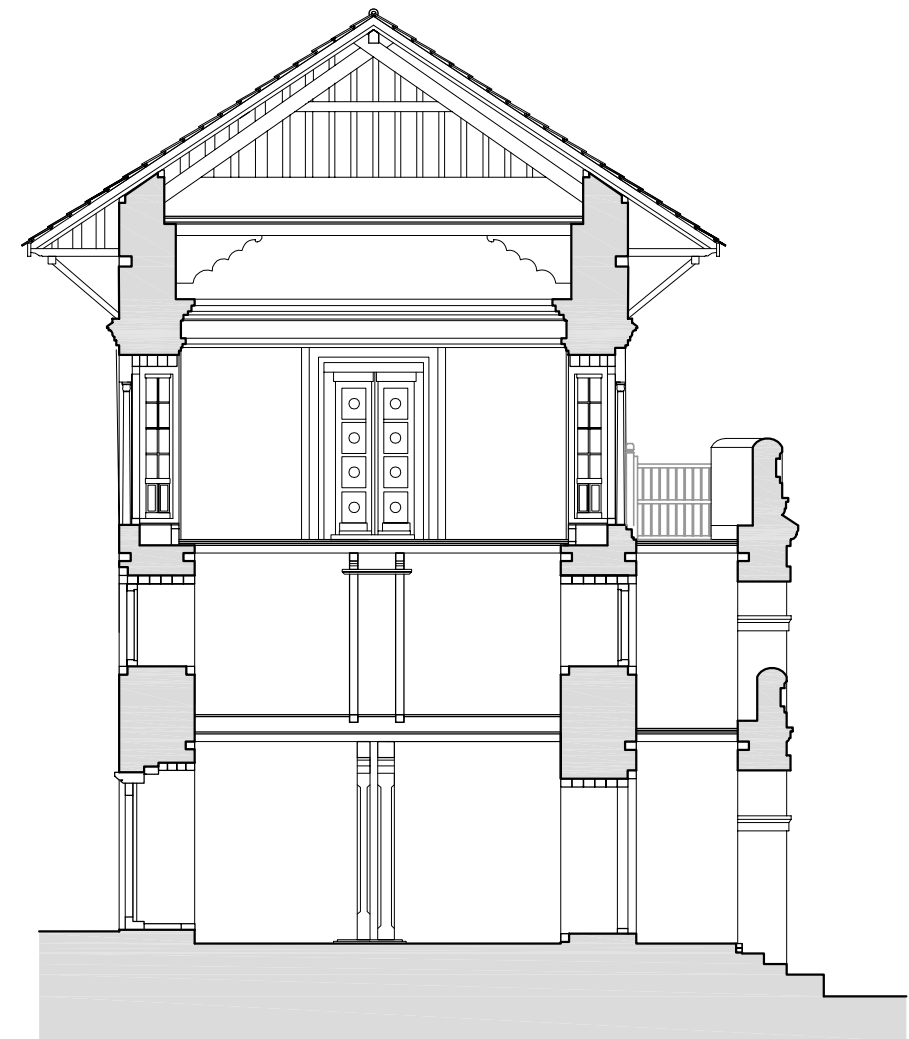
The main stair of the Court Building
This unique pier marks the grand ascent to the upper floors. The original tile treads and risers were recently covered with Portland cement plaster.



Detail of the fine sgraffito frieze above the main entry of the Court Building

Cracking and flaking of the plaster should be checked as soon as possible. Expert advice will be required to stabilize the frieze's condition.

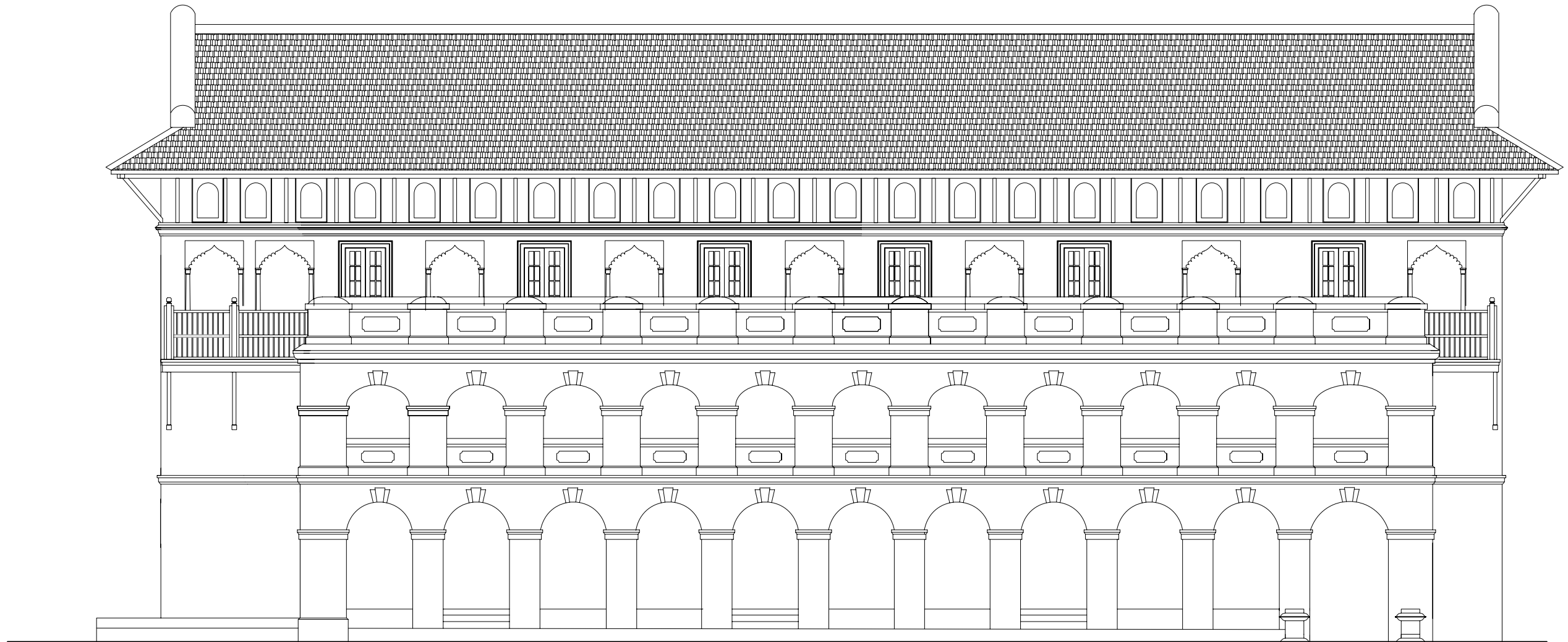
Photograph, May, 2006



Court Building, south elevation, proposed reconstruction

The reconstruction scheme includes the rebuilding of the lost upper story and balcony. The later added brick arcade is to remain.

Drawing Badri Julal, May, 2006



Court Building, south elevation, proposed reconstruction

The reconstruction scheme includes the rebuilding of the lost upper story and balcony.

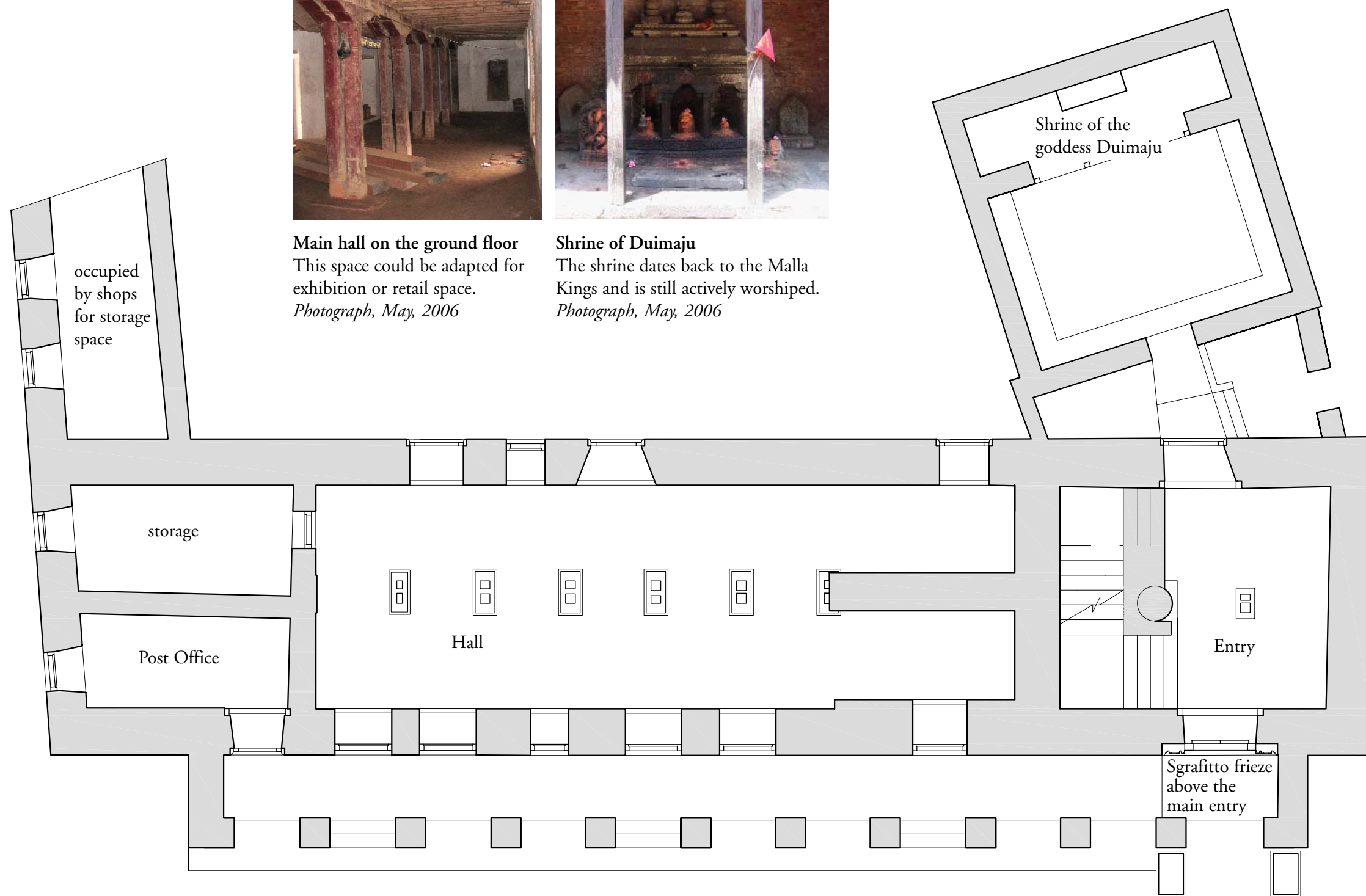
Drawing Badri Julal, May, 2006



Main hall on the ground floor
 This space could be adapted for exhibition or retail space.
Photograph, May, 2006



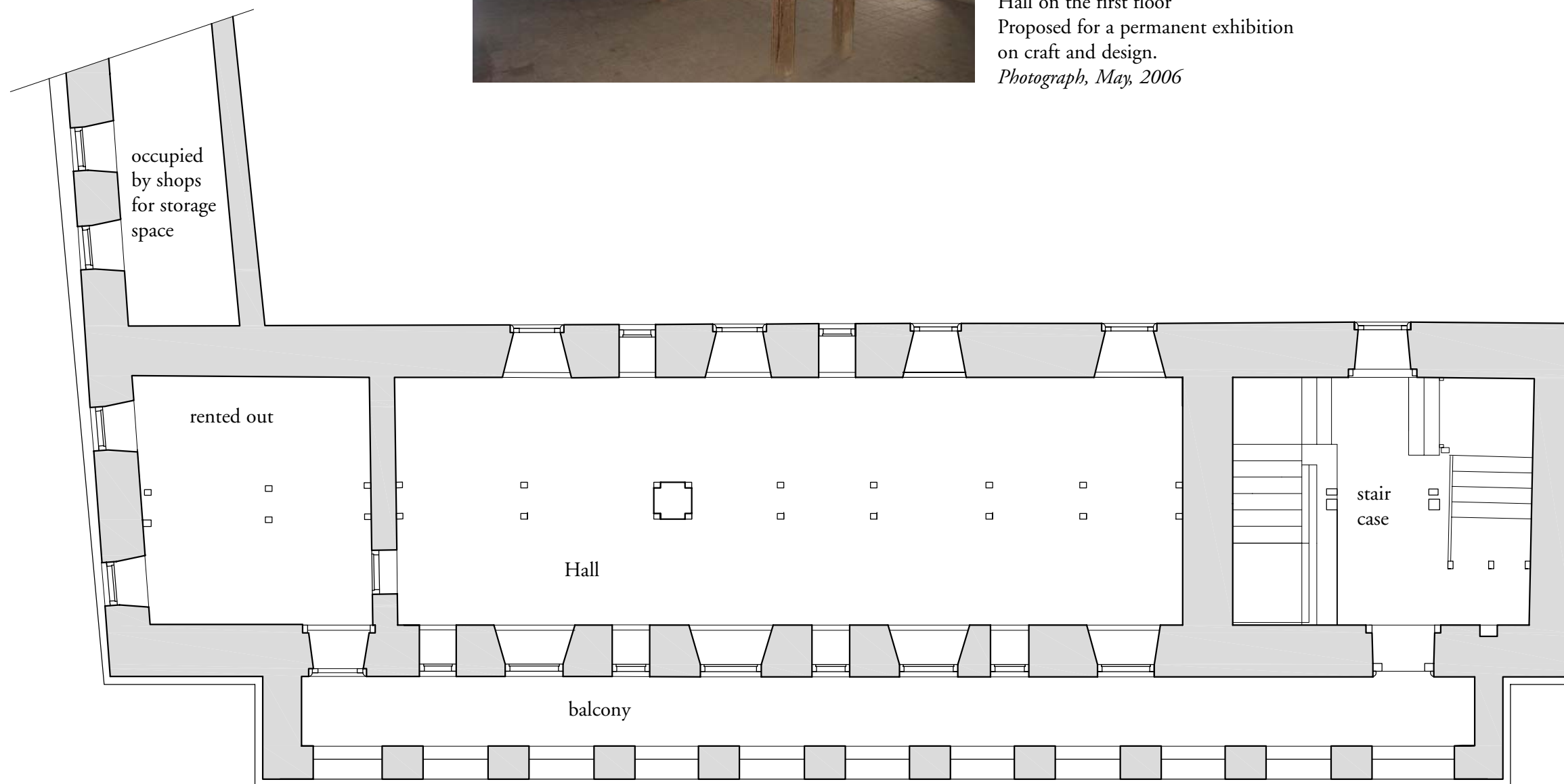
Shrine of Duimaju
 The shrine dates back to the Malla Kings and is still actively worshiped.
Photograph, May, 2006



Court Building - ground floor plan
 Existing conditions
Drawing Badri Julal, May, 2006



Hall on the first floor
Proposed for a permanent exhibition
on craft and design.
Photograph, May, 2006



Court Building - first floor plan
Existing conditions
Drawing Badri Julal, May, 2006



Bhandarkhal garden
Photograph, May, 2006

THE BHANDARKHAL OR TREASURE GARDEN

HISTORY AND DATE AS YET UNRESEARCHED

In addition to Siddhinarasimha's tank the two acre Bhandarkhal (treasure garden, from the Sanskrit *bhandagara*, treasury) also contains three historic open air shrines, and a collection of concrete buildings occupied by the Department of Archaeology. In recent years the Bhandarkhal is more commonly known as the Archaeological Garden because it has become a repository of sorts for miscellaneous sculptures and stone inscriptions in the possession of the Department of Archaeology. The Department of Archaeology maintains a conservation laboratory there. The garden is not accessible to the general public.

Historically the Bhandarkhal, in addition to a royal treasury, likely contained kitchen gardens and service areas linked to the ceremonial spaces of the Palace. Future research will be required to assess the historical uses and shape of this space. A comparative study with the Kathmandu and Bhaktapur palaces and adjacent gardens will be part of this work.

In the context of unchecked urban growth in the Kathmandu Valley, the garden represents the only remaining landscape planning resource within the precincts of the city. The garden's development as an integral part of the palace precinct, as defined by UNESCO World Heritage List, by the Municipal Government and the Department of Archaeology must be explored for compatible and mutually sensitive uses.



Views of the Patan Museum interiors

above, left: Traditional wall niches enliven this narrow staircase. They have been adapted for showcases with concealed lighting from above.

above, center: A 12th century image of Shakyamuni Buddha displayed in a specially designed alcove. The embracing gesture of the thick wall emphasizes the eminence of the exhibit without any external adornments.

above, right: This small gallery blends diffused daylight with that of incandescent spotlights for exhibit illumination.

OPPORTUNITIES FOR ADAPTIVE REUSE

Developing an effective and appropriate plan for the adaptive reuse of the structures of the Patan Royal Palace Complex is a significant challenge of the project.

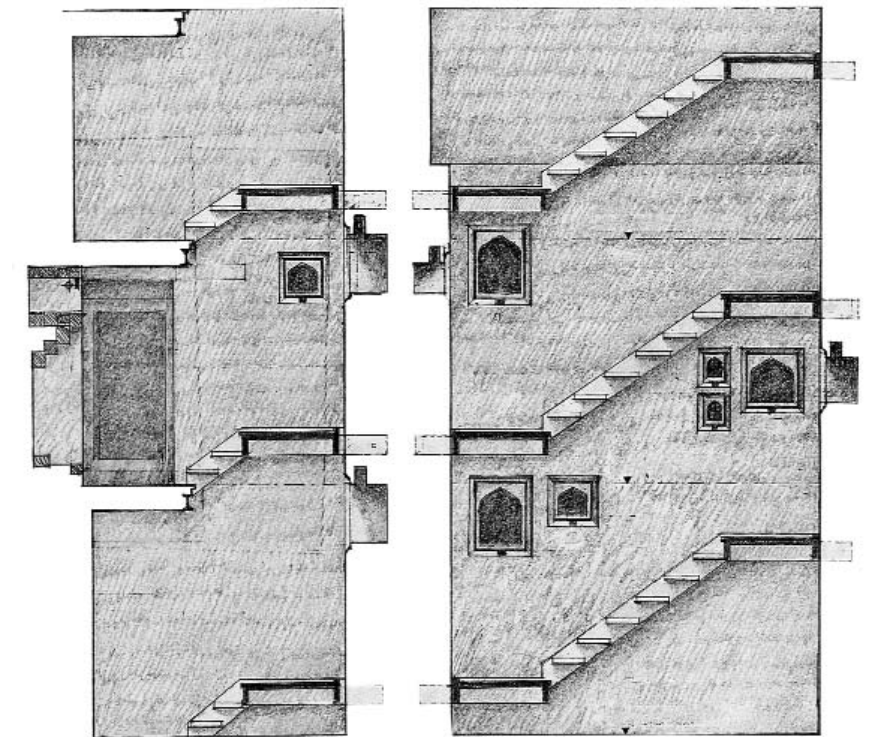
The government's request to extend the Patan Museum, now housed in one restored quadrangle of the complex, may provide a sound starting point for this exercise. This museum, which was developed with Austrian foreign aid from 1984-1997 is a highly acclaimed and popular cultural institution. It has been favorably received by both local and international visitors and friends of Nepal. It is also a model for management of historic buildings in Nepal as a well-managed institution which falls under the Department of Archaeology, effectively managed by a semi-autonomous Board. This management model, developed by the project, takes advantage of the government's Development Committee Act.

The Museum takes as its mission the presentation of the arts of the Kathmandu Valley in a religious, cultural, and crafts context. Curatorial direction by Mary Slusser, Fellow Smithsonian Institution, with carefully designed exhibits, collages, and presentation by Götz Hagmüller in a restored, adapted historical building is highly effective.

Having reviewed the Museum collections and strengths, the consultants have identified one particular focus, the architecture of Nepal, as a possible focus for the expanded facilities. It should be stated that the collections of the Patan Museum are generally fixed and there is no acquisition plan. (Some of the collection has come from recovered stolen art.) Thus, the goal may not be to exhibit additional pieces in the collection of the museum, but to expand the range of media and cultural interpretations. Architecture as a focus could do this with the further advantage of being economical. In addition, a collection of architectural fragments could be assembled from friends of Nepal to exhibit woodcarving.

A preliminary study in 1992 prepared by GTZ Patan Programme in collaboration with Patan Municipality and the Department of Archaeology developed the concept of a museum of architecture as several rooms in the present museum, but was never realized. The spaces of the Sundari Cok and Mul Cok are extremely confined—with room widths of under three meters and ceiling heights of approximately two meters. An expanded museum could provide exhibition space for the exploration of topics relating to Nepalese architecture, arts and crafts, and house a study and research center of Nepalese architecture. One very clear advantage of a collection of flat exhibits like architectural drawings is the very narrow room configuration of the complex: thus, one could utilize the great wall areas with few interventions into the historical walls.

As the Nepal Architecture Archive has been established at Harvard University's Frances Loeb Library by the Kathmandu Valley Preservation Trust, the development of the satellite collection and possible study area in this complex seems appropriate. (At present the nearby Trust headquarters plays such a role for visiting scholars, professionals, local students, and scholars.)



Section and elevation of the Patan Museum staircase
Design by Götz Hagmüller



Patan Museum

above: Main staircase with a view towards the garden

above, right: Gallery of Buddhist art in the newly reconstructed East wing of Keshav Narayan Cok Palace

For a museum of Nepalese architecture, Sundari Cok, architecturally the most significant structure of the Complex, serves as a destination in and of itself. While the depth of the rooms precludes the display of large object or exhibition cases the rooms could easily be utilized for flat exhibits, or to present digital educational media to explore architectural themes. The space could also provide a setting for contemporary presentation of a special collection of Newar ritual and everyday objects (including art, furniture, jewelry and dress).

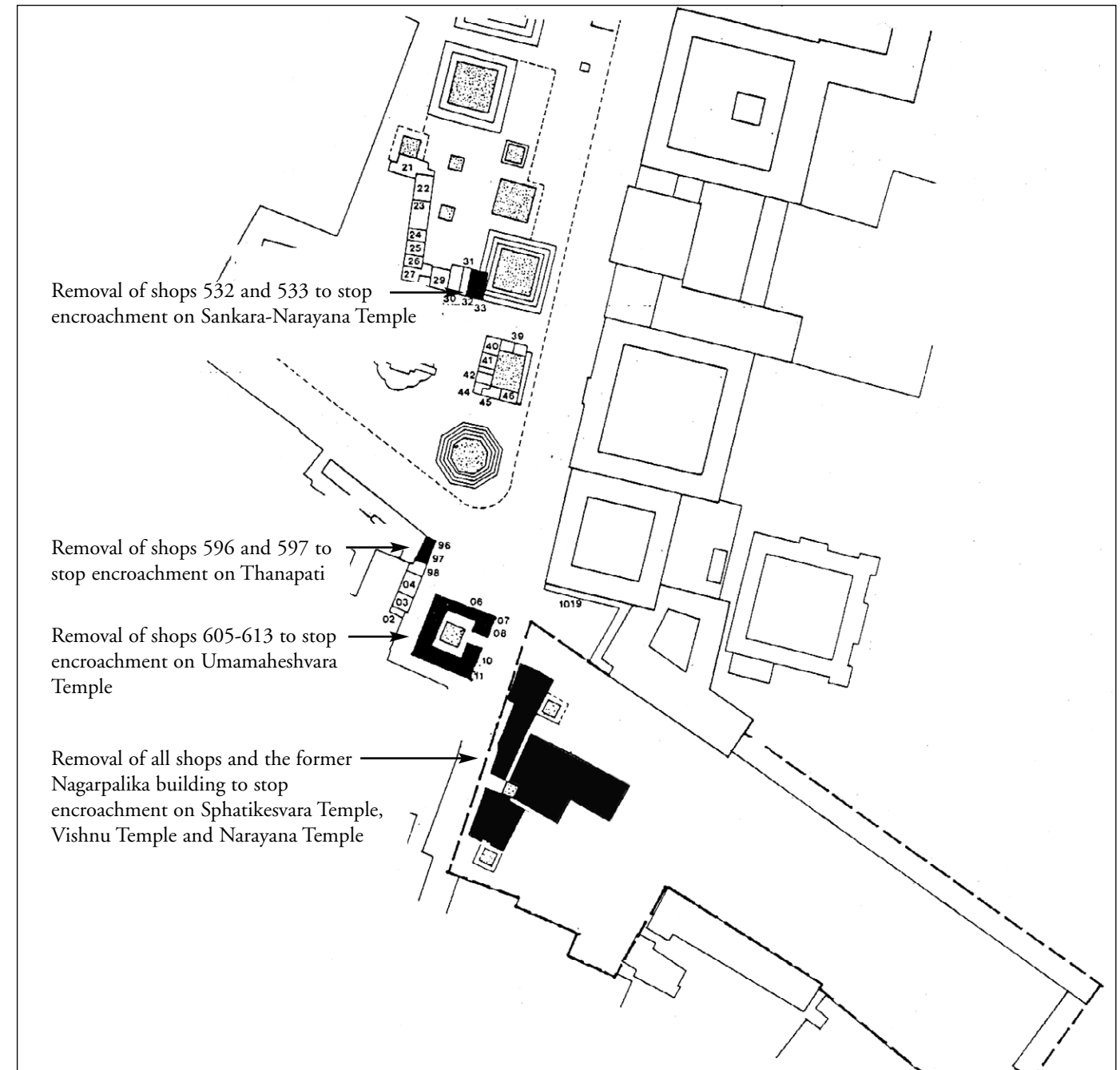
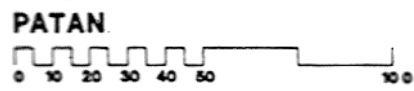
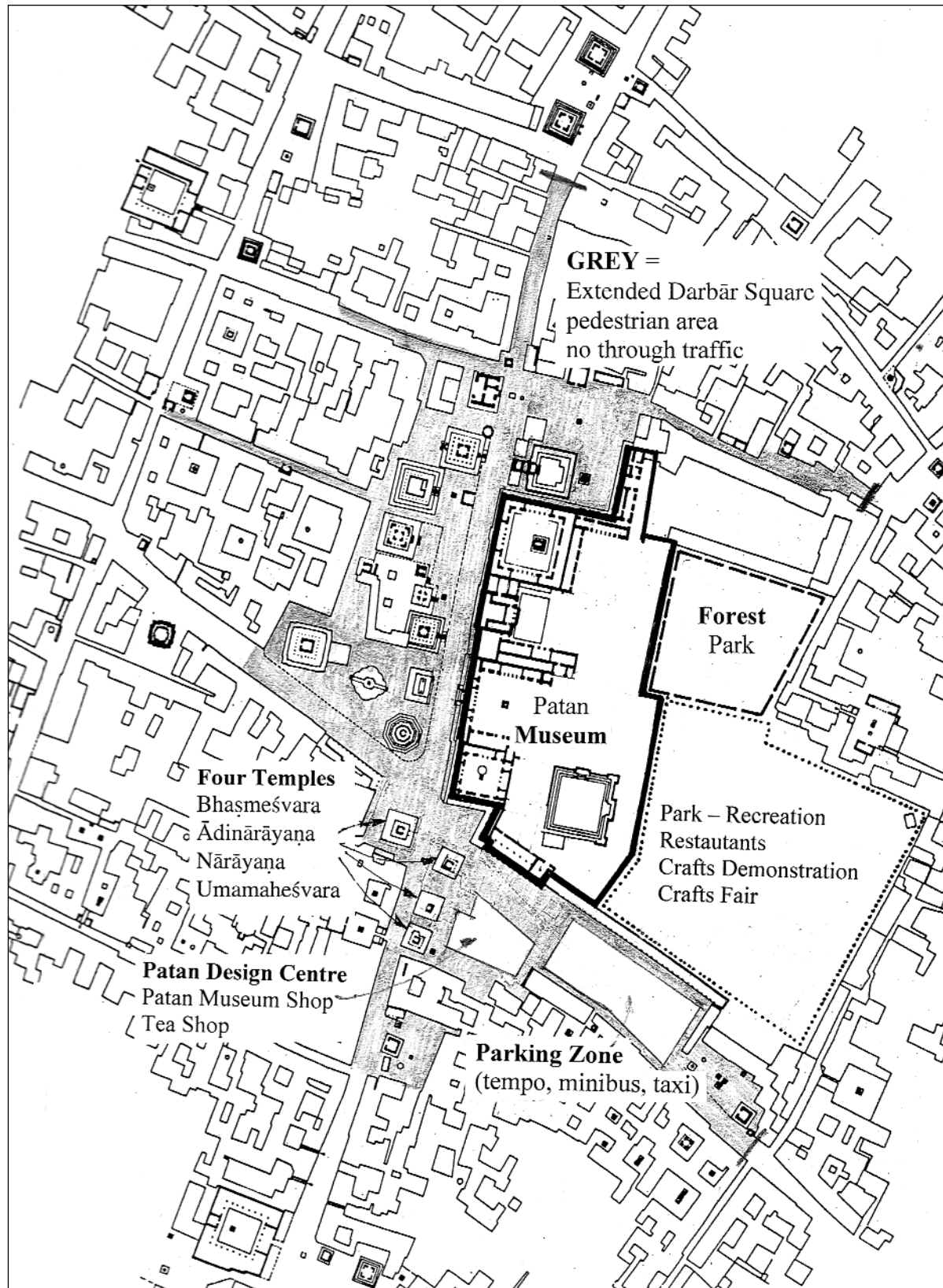
The area to the rear of Sundari Cok includes additional outdoor spaces and the Bhandarkhal Tank, both of which can be explored as outdoor foci for the expanded Museum. The Patan Museum developed its rear garden area, where little or no historical structures survived, as a restaurant garden area. Furthermore, excavation of the debris left after the 1934 earthquake will facilitate the restoration of a paved circulation area that could relate the tank with a proposed restored east façade of Sundari Cok and restore the volume of the tank to its original appearance.

A comprehensive master plan for the restoration and conservation project (including anticipated stages of implementation work) which takes into account the major and minor structures of the complex, the needs and opportunities of the museum, current uses, and the relative assets and limitations of the buildings—both as monuments and income generators—will be developed. One particularly promising mechanism to save historical structures should be mentioned in this context, namely, the possibility to lease structures out to cultural non-governmental organizations (research center, craft center, media center, etc.) for restoration/adaptive reuse. Thus, one goal of the proposed study will be to develop a strategy for which buildings could be leased to help finance the conservation and management of other structures as part of the expanded Museum. Other preliminary observations are mentioned below.

The North Wing with its generous wide hall offers a generous and architecturally significant interior space. It is currently used for storage and occasional seminars by a school which leases space from the Department of Archaeology. This situation should be reviewed carefully to assess the appropriateness of the school's use of the palace wing.

The Court building was recently vacated by the judicial office and stands vacant under the control of the Department of Archaeology. This structure, together with the adjacent Pati or rest house arcade both have street frontage on the main artery of Patan. The Court building offers larger scale spaces which have been insensitively renovated recently, although certain measures such as plaster may be reversible.

The relationship of the garden and the museum is a critical point for ongoing discussion and refinement of planning strategies. At this time the preliminary formulation of the mission is that the structures of the Patan Royal Palace complex form a distinct architectural ensemble of the highest artistic and historical caliber. This complex is enhanced by the adjacent garden which is a historical site rich in historical associations and contains an historical monument of first class importance, the Bhandarkhal tank with its rich decoration. A goal of ongoing research must be how to integrate palace and garden while delineating a boundary between the palace complex and garden which serves to prioritize conservation goals and inform buffer zone management.



above: Proposal for removal of shops that are encroaching on historic temples and buildings.
 (from: *The World Heritage Site Monument Zone: Darbar Square, preliminary proposals for improvement*, Patan Programme, UDLE, GTZ, December 1992)

left: Overview of the extended Patan Darbar Square

Located in the centre of the historic city core, the Palace Complex and its adjacent square with many free standing temples was until the early 1990s easily accessed by both public and private means of transport. In 1994 the main square was declared a pedestrian zone and closed to vehicular traffic with bollards and chains. At the same time heavy vehicles such as buses and trucks were banned from the historic city during daytime, tourist coaches were forced to park at the west entry of central Patan. Since 1996 a small pay-parking area on the southern Darbar Square has provided space for some 15 private cars. Taxis and tempos (3-wheeled public transport) stop along the west-east road, constantly being chased away by whistling policemen.

The integrated traffic plan prepared in 1993 by the Patan Conservation and Development Program was never implemented. Till today cars are allowed to go wherever the road is wide enough (with the exception of the main Darbar Square). The ever increasing numbers of cars and motorbikes create nightmarish traffic jams.

Future planning should extend the central pedestrian area and place road blocks to prevent through traffic. The central Darbar Square and subsequently the Patan Royal Complex with the Patan Museum and the garden would be reached only from the West. Parking facilities above ground would only be provided to taxis, tempos and mini-buses. New underground parking facilities would have to be created for the ever increasing number of private vehicles.

Urban space – potential development:

Because the four temples located south of the east-west axis were not properly reconstructed after the 1934-earthquake, the southern end of the Darbar Square remains neglected and also not architecturally integrated into the main square. Encroachments around the small temples and the appropriation of formerly open space by the old municipality building further add to the problems on this southern end. The potential of this southern area needs to be discerned. Removing some 20 makeshift shops that encroach on temples and demolishing the former municipality building and the nearby toilet structure will extend the spatial continuity of the square beyond the city's east-west axis. Besides regaining the dignity of four important temples, space will be recovered for future structures that could house the Patan Museum retail operations. The reconstructed Court Building in its three-storeyed configuration will house the Nepal Design Centre, a gallery for travelling exhibitions, and a tea-shop.

Restructuring and redesigning the southern end of the Darbar Square will form a major project component that will enable the Patan Museum, the Design Centre, and the garden with its recreational potential to become a major cultural centre of the city.



Small residential house facing the South side of Patan Darbar
The ensemble with Lam Pati on the left and post-earthquake residential buildings on the right form the southern edge of the square. Restoration of the traditional roof cover would likely decrease the risk of their loss.
Photograph, May, 2006

PILOT PROJECTS

TALEJU BELL AND RESIDENTIAL ROOF REPAIRS

Although the Patan Darbar Square was beyond the scope of the Mission the interactive relationship between palace and the public square is strong and thus the Conservation Management Plan must address key issues on the square. At this time, general small scale repair schemes, or pilot projects, can be identified which are both important and would improve the context of the palace.

One such project is the deteriorated roofing of the shops that surround the Taleju Bell facing Mul Cok. The bell and stone platform date to 1737 but it appears that the commercial space that surrounds the platform dates to the 19th century. Early 20th century photographs document the presence of an ambulatory and lime plaster balustrade above the shops. A study of the structure will determine the necessary repairs to the roof cover and explore the appropriateness of reconstructing the ambulatory and balustrade.

Another project addresses the issue of the numerous private buildings that create the southern edge of the square and whose loss or modification would detract from the historical and artistic environment of the World Heritage Site. It is clear that small scale assistance to such buildings, especially for the repair of the traditional tile roofs, would greatly decrease the risk of their loss or unsightly modification. The row of townhouses which define the southern edge of the square can be identified as a potential focus for roof repairs. Many of the buildings in this row retain their tiled roofs, although damaged areas, patches with corrugated metal, and temporary tarpaulin cover suggest that these roofs will not last much longer.



View of the Taleju Bell with Mul Cok, Sundari Cok and the Taleju Temple in the background

The shops around the bell, although located in a prime retail space, do not generate sufficient income for the guthi to properly maintain the structure.

Photograph, May, 2006

CONSERVATION ISSUES

GIORGIO GIANIGHIAN

Extending Patan Museum

Notes concerning the different aspects of the architectural quality of the Palace's components, and their influence on the rehabilitation and conservation project

Historical enlargements, additions, and layering constitute common procedures that effect relevant architectural complexes. It is very rare indeed that every part of the Patan Palace has been built at the same time. From the studies of Mary S. Slusser we learn that, "It is evident that through the years Patan rulers built and rebuilt the palace quadrangles (chowks) to suite their temporal and secular needs." ¹

The Sundari Cok with its Tusha Hiti, the striking example of a ritual fountain established by a king, represents the beginning of a grand scheme to extend an earlier palace. The wide courtyard of Mul Cok was added in 1666, and eventually the Caukot quadrangle was reshaped in 1734 – after other doings and undoings. Except Sundari Cok, all other structures were reshaped, both inside and out, to accommodate administrative offices to serve the newly established state of Nepal. Looking at the back elevations of the Keshava Narayan Cok (prior to the reconstruction in 1992 to serve the Patan Museum), Mul Cok and Sundari Cok, they are all incomparably inferior, in terms of architecture, to the main facing Darbar Square and the courtyards. All of these rear elevations came up after the 1934 earthquake to serve a school, a police post cum jail and government offices. We do not know how these elevations looked like in the 18th century before the following interventions. But it is easy to argue that, as in many other places of the entire world, what has to be seen by the king and by the public, must be of the highest quality, and the back elevations may remain simply design, if not even poor.

It is a well known fact that it is uncommon to find the same architectural quality in every component of a building, even in the most complete and fully resolved one, and we can imagine not in a single building, but in a king's palace, which usually surpasses, for its dimensions and core location, architecture, to become urban fabric.

Another aspect that influences architectural homogeneity and continuity is due to dramatic events, such as fires or earthquakes, and the consequent reconstruction of the parts; it may follow the same principles expressed above; high quality for the visible, poor for the back.

This is an important architectural choice, decided – designed – by the architect of the time, and accepted by the court, if not by the king himself.

A third aspect, as important as the previous ones, is the political one: in 1769 the Patan Palace lost its function as the king's residence, and from that date the use of the complex became administrative. Easy to understand that in case of fire, or earthquake, or just the need of change, the architectural quality of the alterations and transformations will follow a lower profile, linked to the new lower quality use of it, compared with the previous one.

To transform, or convert, the Sundari Cok into a police station, it is self evident that the design will correspond to the new use. In other terms, it will consist of a poor elevation, when compared with the courtyard or west elevations belonging to the very same wing of the complex.

What does it mean, this coexistence of two opposite elevations? Does the poor affect the rich, at the point of diminishing the value of the latter? Since this is the reality so diffused all over the world, when dealing with such extended complexes, I would say that this is not a reduction but a richness, maybe not in architecture strictu sensu, but in the meaning of history translated into bricks, stones, timber.

The mission is of the opinion, that the present back elevations of Mul Cok and Sundari Cok – probably meant to be "poor" from the beginning or at least at later stages – deserve respect before converting the present condition into a coherent façade, following Newar principles of design (such an option is presented in this report on page 50). The problem arises now, when we decide to transform the rear elevations into front elevations, and the visitor can immediately compare the elevations, in their different display.

Another issue may derive from the configuration of the backs of the Palace, in order to prepare a proposal to a design solution to the many needs of a new museum, as a major space in the only possible place for large displays and other collective functions. The solution can be found, obviously, only in the rear because that is where there is the space and possibility to extend. But how to build a new space in that area, in which the poor quality of architecture will be visible? Katsuhiko Watanabe in his important study on the Patan Palace presents a plan, declaring that it derives from Slusser's proposed reconstruction, as in the back of

Sundari Cok there was a sort of courtyard structure, if not a building. Considering that the king, walking to the reservoir to collect lotus flowers every morning for worshipping purposes, had to pass through this space it must have been of a similar quality to the west wing. Looking at Figure 6 of Slusser's book, both for Sundari Cok and for Mul Cok, the remains of solid walls are visible. For Sundari Cok, even a sloping roof is clearly identifiable, for Mul Cok parts of walls extending east into the garden are visible. Remains almost deleted by the earthquake of 1934, but visible and demonstrating the old – which can become the new – way of solving the problem. If needed, for new spaces related to new uses, we may build toward the garden, utilizing the same concept of previous times. The problem now consists in how to design it. The idea of preserving the eastern facades of Mul Cok and Sundari Cok, transforming them into internal facades – with some functional modifications – enveloping them and the empty spaces facing the garden into – a schematic idea indeed! – crystal box, creating a relatively big volume at the back, apt to contain many of the new possible uses for a living museum, could be just a first concept to be explored by an architect's hand. The second stage of this concept will be fulfilled, in a short period, by schematic design proposals. By now, we are happy with the demonstration that there was something built in the courtyards towards the garden in historical times, and that can ground a proposal for a contemporary new addition.

Notes concerning the conservation aspects of the Palace

In order to prepare a detailed conservation project, it is necessary to verify and integrate the existing partial survey prepared by an international group of experts in the scale of 1:10, but incomplete. The survey will be prepared with the most updated techniques and instruments. The knowledge of all the components of the palace complex will be fulfilled with other analysis, according to the following index:

Measured survey, based upon a topographic grid and laser leveling; photogrammetry for the elevations. Building materials survey, using the photogrammetric survey and the mosaic of photographic survey.

Condition survey:

Static behavior and static condition survey with sonic and ultrasonic tests, string gauges, limited number of drilling carrots to test for: load bearing capacity of foundations and walls, load bearing capacity of floors, load bearing capacity of roofs.

Scientific analysis and non-destructive tests, extracting – when necessary – a limited number of samples to test for: air pollution, humidity in walls, composition and quality of mortars, Botanical, biological, and microbiological infestations, insect infestations

Only after executing all the previous studies and analysis, revising the accomplished historical research, will it be possible, putting together the collected information, to understand the nature and variety of problems that the conservation project will solve. As Sir Bernard Feilden wrote, "Conservation is ... primarily a process which leads to the prolongation of the life of cultural properties for its utilization now and in the future." Describing the meaning of conservation, the same author says that, "Conservation is the action taken to prevent decay... (adding that) the minimum effective action is always the best; if possible, the action should be reversible and not prejudice possible future interventions." A quarter of a century later it will be hard to disagree with such convincing and valuable words! Preserving the life of all the components of a cultural property, in its physical, material evidence, respecting the historical values but also the local way of evaluating them. In other terms, after the Nara Declaration of 1992, the local way of attributing values to the heritage must be taken into account. If, basically, the project will try its best to prolong the physical life – of each of the components of the Palace, in some cases it is already visible and clear the need to proceed with some substitutions of the most decayed elements, according to the local way of tackling these sorts of problems. It has to be considered that we are in a country in which the living heritage of the artisans is still producing extremely high quality integrations to the decayed heritage, and the fact is not simply recognized but also expected after the restoration of a historic fabric. During the restoration of some parts, as some roof structures, poorly replaced a few decades ago in a sort of emergency intervention, as of the Kumari house, the intervention itself was so poorly done, and the leaking rain water is well visible along many of the internal facades, that the substitution is inevitable and even well accepted, because it will be also possible to correct the slope. The correction will provide a better solution against the penetration of rain water, but also a visual adjustment of the roof in the relationship with the others in the Palace.

1 Mary Shepard Slusser, *Nepal Mandala, A Cultural Study of the Kathmandu Valley*, Princeton University Press, Princeton, New Jersey, 1998, Vol. 1, p. 203.

NOTES ON AUTHENTICITY

ERICH THEOPHILE

Intentionality, actors, earthquakes, and skin

The general methodology on the previous pages could be applied to study many different buildings in different contexts around the world. One can supplement this approach with two important perspectives. First, what are criteria specific to this type or period of building which can be used to make decisions? And second, what do we know, we a group of architects working in the Kathmandu Valley with collective experience in restoration/preservation of some 50 years, that are relevant for application of preservation principles here? The following outlines key criteria.

Earthquake damage and reconstructions

A major earthquake in 1934 ravaged much of the Valley, the effects of which are very much visible today. These effects include hasty reconstructions which took place during a period of material scarcity. Many roofs were rebuilt with undersized timbers and shortened roof overhangs. Wood scarcity forced wider spacing of roof rafters and the lightweight roofing system of dry-laid terracotta tiles replaced the much heavier *jhingati* tile and mud bed roofs of previous centuries. In some cases the then-ruling Rana clan and their builders elected to rebuild in a different style over the surviving plinths or lower walls which withstood the shocks best and often survived. Thus already, in considering earthquake rebuilding, one can discern two types of interventions—the forced, scarcity-imposed, and the intentional, style driven.

Government restoration work and the breakdown of the crafts system

Another major factor affecting the fabric of historic buildings in the Kathmandu Valley is the working style of the central government over the last fifty years. Under the Department of Archaeology and the Guthi Sansthan (both centralized offices forced to work under quantity and estimate systems imposed from Indian civil works practices), the manpower and crafts system broke down to make way for hybrid building practices, functions of contractors, cost cutting, and the lack of individual project patronage. A private temple renovation in previous

centuries would have had a donor supervising and controlling every move of the craftsmen, but recent government patronage embodies an outsider mentality – the government overseer managing a temple renovation is not a paying patron for woodcarvings. Thus craftsmen working for government rates create both poor quality carving as well as iconographic programs without meaning, the whim of government servant or the accident of the moment.

Guidelines for assessing fabric retention, interventions, & design

Should one keep the 1935 roof of a temple when it appears to be rebuilt at the wrong pitch and length because it is already historical i.e. 70 years old? We think not, but the circa 1935 plastered domed structure that was constructed to replace a tile roofed building begs an altogether different question – it can be considered for preservation as an expression of aesthetic ambition. I think it is important to distinguish between the two as recent recommendations by visiting experts for repair schemes in Nepal have promoted a general anti-scrape approach. This attitude regards all historical layers as meriting conservation, not distinguishing between ad-hoc repairs and artistic modifications, a radical thought when exported from the first to third worlds.

Do the changes effected by under-funded government projects also deserve to be preserved alongside other, earlier historical layers? No blanket statement can be made, but the cases where interventions by government sector agencies are interesting or high in quality are few. Thus, when conservative approaches encourage us to consider more recent layers of history as important layers to conserve, we must acknowledge that poor quality often characterizes government restoration practices and the hasty post-1935 earthquake rebuilding/restoration which took place during a period of material scarcity.

After twenty years of studying buildings in Nepal and meeting the majority of them with some compromise of their 19th century or earlier configuration or building fabric integrity, it is easy to say that a premise of our repair schemes should be to remove those layers which detract from the historical forms and to prioritize quality or the building's "dignity, a subjective quality to be assessed on a case-by-case basis.

The historic configuration of structures such as roof pitch, overhang, rafter spacing, and the placement of openings are norms which are consistent through the centuries and have only changed over the last seventy years. Interventions that restore these are favored. The desire is not only an aesthetic one; the increased roof overhang and pitch, and the strengthening of structure through closer rafter spacing contribute to the building's structural integrity and longer life.

Quality of work is a criterion for retention of later layers. For structural timber there are very few cases where historical beams or joists are not badly damaged or represent a decent level of craftsmanship. We use the word decent because in general the interior structures of these buildings are crude in contrast with the care of execution that characterizes the more visible woodcarvings. Also, poor quality woodcarvings from a government-sponsored renovation could be considered for replacement by contemporary higher quality pieces.

Building materials and methods

A few specific features of the traditional building formula play a role in the evaluation of historical layers and the ability to conserve them. These include the multi-layered masonry wall structure which is prone to delaminate, the lack of damp-proof courses, and the vulnerability of the tile roofing system. The upshot of these three conventions is that wall surfaces as a rule are quite seriously damaged and fabric retention in these cases must prioritize the romantic image of the damaged structure being beautiful. In fact, this has long been a feature in western views of Nepal. The first published views in 1854 mentioned the "picturesque decay" of much of the city of Patan. (see Gutschow's article in *The Patan Royal Complex, 19th century views and photographs*, KVPT, 2006). Do we want to emphasize this romanticizing the picturesque? This certainly departs from what the citizens of Patan would desire in renewing their buildings.

The retention of historic masonry skin is a difficult issue. At one project, the restoration of Patukva Agam by KVPT, we were able to retain a picturesque façade veneer because of an interior buttressing scheme, but this is often unfeasible. The mediocre brick quality of new

bricks however must be cited as a major reason why the complete rebuilding and replacement of historic masonry fabric is often not favorable.

Some of our wanting to justify retention of more recent layers can be related to the romanticism of 21st century Modernism whose numerous examples of additions and modifications although aesthetically jarring, are often intellectually rigorous. No examples of this are known in Nepal.

The retention of carvings, door and window components must be a high priority for the artistic values of the woodcarving. It also represents traditional practice – many a rebuilding after earthquake has recycled older doors, columns and windows.



View of the Patan Palace complex after the 1934 earthquake
The Degutale Temple collapsed completely even though the lower two stories were built of thick and massive masonry.
Photograph, 1934

SEISMIC ACTIVITY & IMPROVEMENTS TO TRADITIONAL BUILDING TECHNIQUES

ROHIT RANJITKAR

Seismic Reinforcement and Improvements to Traditional Building Techniques

In light of the fact that the Kathmandu Valley experiences a regular cycle of seismic activity it is absolutely necessary to include seismic retrofitting in any plan for the restoration and conservation of historic buildings in the Valley. A review of the history of earthquakes in Nepal suggests that every 90 to 100 years a significant earthquake strikes. We know a little about the earthquake of the 1830s from written documents, and extensive photographic documentation exists from the earthquake of 1934. Combined with extant structural damage, this historic data provides meaningful insight into the potential damage of a future earthquake in the Kathmandu Valley which boasts the country's highest concentration of historic structures.

The extent of the damage to the historic structures of the Kathmandu Valley was largely documented in photographs. After the 1934 earthquake many of these historic buildings were repaired and reconstructed but we also know that many were lost. Considering the fact of having lost so many buildings at that time, imagine what will happen to the cultural property of the Valley after the next earthquake. There will, no doubt, be much less repair and reconstruction than in 1934, because there will be a greater loss of life and injuries due to the higher population density and poorly constructed modern buildings. Under these circumstances, cultural heritage will likely not be a high priority. We can imagine that many damaged monuments will be lost.

Considering this fact and Nepal's location in a high risk seismic zone (zone # 5), the development of sensitive and effective seismic strengthening has always been a part of the restoration process in all of the Kathmandu Valley Preservation Trust projects since 1990. Current conservation practice in the Valley, however, is typically limited to repair work or restoration. Despite the numerous opportunities to improve structural quality or introduce seismic strengthening it is not the norm; in fact, preservation guidelines in Nepal do not encourage it.

Learning from the 1934 earthquake

We know from photographs taken after the 1934 earthquake that many monuments were not rebuilt in historical configurations and that often monuments were rebuilt with reduced

details. Given the vast number of monuments destroyed it is understandable that only a portion was rebuilt, but we must note that even with a small population with many craftsmen and resources available, a limited number of monuments was rebuilt. If we imagine an earthquake in the present context how much could be rebuilt?

From the various photographs taken after the earthquake, we can observe different types of structural damage to the buildings. Certainly after such a damaging earthquake it was not possible to photograph each and every monument, but many photographs of the major monuments were taken which document the basic types of damage. Monuments that escaped major damage often still suffered partial damage. Upper roofs, the top tower of a temple, a timber gallery, or an inclined and overhanging upper level window were parts of buildings that often collapsed. The top tower of the temple was always built above a timber beam and thus lacks vertical continuity. When the earthquake struck, top towers often tipped off the beam. At the west wing of Patan's Sundari Cok only the top roof was partially damaged in the 1934 earthquake. This was likely a result of the heavy load of the roof. Buildings that had timber arcades at the ground level often collapsed completely but this was not always the case. Often buildings with solid walls at the ground level also collapsed completely. In any event, while we can not say there was typical damage associated with specific building types, we can identify typical traditional construction techniques that caused failure.

Analysis of typical failure

Working with the monuments for more than a decade, we have identified critical typical reasons for the failure of traditional buildings during seismic activity.

- Loose timber joints that cannot withstand lateral movement.
- Multilayered brick walls – high fired veneer brick on the outside, regular brick on inside and rubble in between. No real connection between these three layers causes de-lamination under seismic stresses.
- The vertical discontinuity of masonry walls at the base of the upper levels of multi-tiered or so-called pagoda temples
- No horizontal rigidity.
- Top heaviness - mud bed of the roof tiles together with significant roof projection create a heavy roof.



Bhaktapur Darbar Square
Comparative views before and after the 1934 earthquake

- Soft story conditions - particularly open ground floor timber arcades with little or no tying into to structure.

Improvement of traditional construction techniques

The ICOMOS charter of Venice, a basic international policy document, explicitly states in article 10: “Where traditional techniques prove inadequate, the consolidation of a monument can be achieved by the use of any modern techniques for conservation and construction, the efficacy of which has been shown by scientific data and proved by experience.” In many instances it might not be possible to use traditional methods and local materials for reinforcement. The use of modern or untraditional materials however should be considered carefully and should be used in a manner that preserves the original spirit of the monuments.

Building components of the traditional structure and required improvements

Foundation

Foundations need test pit excavations to determine if any seismic related improvements are necessary. KVPT often recommends filling the gap between the walls and foundation to create a base pad for the entire building. This will act as one solid base or platform in any movement.

Wall reinforcement

Portions where the facades will be rebuilt, stainless steel wire or rod is recommended to improve lateral and through-wall connections of the wall. All work is done using mud mortar which is a positive binding material for its shock absorbent character. Additionally the veneer brick bonding with inner layers can be improved by increasing the number of header bricks that extend into the wall core.

Roof reinforcement

The roof is the most critical part of the building and is often where damage occurs in historic buildings. Due to heaviness and looseness, it is always in danger with any kind of movement. To counteract this looseness, lath or planking above the rafter can be replaced with plywood which unites roof timber members and creates a uniform surface for a water proof membrane.

Timber joinery improvement

In traditional structures the connection between timber elements is often loose and needs to be tightened: connection between rafters and wall plates – rafters are traditionally not notched to the wall plate and are held in place only by a timber peg. The introduction of

concealed stainless steel bolting on every third rafter together with notching of each rafter improves the rigidity of the roof frames; connection between rafter to rafter can be achieved with the use of plywood; connection between rafters and purlin can be improved by introducing L shaped brackets or stainless steel pins; connection between wall plate to wall plate – the traditional configuration of double layered wall plate can be developed as a timber ring beam by careful sizing and joinery at the corners, improved by concealed metal angles at the corners; tying struts to purlin and strut base with steel straps, pins, or plates; tying together vertical and horizontal members; reinforcing traditional timber pegs,

Horizontal rigid plate

The development of a rigid plate, like the ring beam, is a consolidating measure to help the structure react as a larger whole in the event of an earthquake. This is something easy to introduce in old buildings, due to the thick mud floor which allows the intervention to be hidden. It can be concealed in the floor using stainless steel straps or can be constructed of two layers of planking laid at 45 degrees and through-nailed to achieve greater rigidity.

Vertical bracing

In the west, the technique of drilling continuous vertical rods into historical and loose masonry structure is a norm. In Nepal, however not only is this technology unavailable, but the buildings are extraordinarily loose, made up as a three layered wall with existence of horizontal timber members makes it almost impossible to conceal. Surface installation can be concealed with lime surkhi plaster and locations need to be determined based on existing openings.

There is no general solution to stabilize the historic buildings against seismic activity. The implementation of structural improvements should be based on artistic importance, future use, and on the seismic analysis of the present condition. In each case a specific solution has to be found which can achieve a balance between the authentic spirit of the monument and safeguarding the structure.

The courtyard buildings of Mul Cok and Sundari Cok, of which more than 80% survived the 1934 earthquake, will not pose major challenges for seismic strengthening. The Agam tower above Mul Cok’ southern wing and the adjacent Taleju will, however, demand serious study both to assess risk and design strengthening interventions.

APPENDIX 1

ANNOTATED CHRONOLOGY OF PAST MISSIONS AND REPORTS

1975 Kathmandu Valley, The Preservation of Physical Environment & Cultural Heritage: A Protective Inventory
HMG Nepal in collaboration with the United Nations and UNESCSO, Vienna

In the early 1970s the United Nations Development Programme funded a planning office in Nepal, and Carl Pruscha, a former student of Professor Sekler and an architect in Josef Luis Sert's architectural firm, was selected to lead it. While planning for the future growth of the Valley, Pruscha was concerned about the fate of Nepal's historic structures. His two volume inventory about the preservation of cultural heritage in the Kathmandu Valley was published with the notable subtitle, "A Protective Inventory."

1977 Master Plan for the Conservation of the Cultural Heritage of the Kathmandu Valley
UNESCO, Paris

In May and June of 1975 a team of experts under the leadership of Eduard F. Sekler visited the Kathmandu Valley to draw up a *Master Plan for the Conservation of Cultural Heritage*. The Plan addressed various issues, but did not present conservation schemes for individual structures such as the Patan Palace. Of interest to the current mission was a proposal for a National Museum which would include a "Museum of Urbanism and Architecture in Nepal".

From the report: "The development of advanced civilizations with urban centres in the heart of the Himalayan Ranges is unquestionably one of the greatest, if not the greatest cultural achievement of the people living in what is known as Nepal today. Not only have towns been formed here, but also characteristic and distinctive building styles have developed, with both secular and sacred forms. It is suggested therefore that both the urban and architectural history should be presented in this museum. The history of the individual towns could be exhibited in town plans which indicate historical development. These plans could be supplemented by examples of streetscapes; similarly there could be plans of various infrastructural facilities with their variations: finally various social structures could be presented in the urban framework. Such a presentation would be even more vivid if suitable models and other visual aids were used. In the part of the museum given over to architectural history, the development and typology of religious and secular architecture, together with their evolution, could be displayed. It would be necessary to draw attention to historical connections and affiliations and to survey the historical sequence through the 18th century. Equally the architecture of the Rana palaces would serve as an additional subject. The

individual architectural monuments and types could be presented in plans, elevations and models, to be supplemented by actual full scale elements, taken from dismantled buildings. To house this there is no need for a vast museum. As permanent quarters that part of the Hanuman Dhoka which is presently being restored would serve splendidly; it is sufficient in size and only requires a few interior alterations. A building so dignified and steeped in tradition is particularly well suited to display the greatest achievement of its inhabitants."

The idea of establishing a Museum of Architecture was again taken up and modified in 1991 in the context of a formal request by HMG to the German Technical Cooperation (GTZ). Housing such a museum was planned in the southern wing of the Keshav Narayan Cok, which, with Austrian aid, was remodeled as a museum from 1984 to 1997. The planning of an architectural archive and even the acquisition of exhibits started in 1992 under the aegis of the Patan Conservation and Development Programme, but was given up due to financial constraints in 1993.

1980 Proposal for the Urbanistic Conservation of Patan (Lalitpur) Durbar Square as a Monument Zone
Harvard University, Cambridge

Again under the leadership of Eduard F. Sekler the proposal addressed the architectural integrity of the square by emphasizing the need to control demolition and new construction on the periphery of the square. The conservation of individual Palace structures was not addressed.

1981 The Royal Buildings in Nepal, A Report on the old Royal Palaces of the Kingdom of Nepal
Nippon Institute of Technology

1985 The Royal Buildings and Buddhist Monasteries in Nepal
Nippon Institute of Technology

From 1975 a team of Japanese architects from the Nippon Institute of Technology under the leadership of M. Fujioka and Katsuhiko Watanabe undertook documentation in the Kathmandu Valley. The Patan Palace was surveyed in autumn of 1977. Elevations of Mul Cok and Sundari Cok were documented on the basis of a photogrammetrical survey at the scale of 1:50. Published plans were presented at 1:200 and elevations at 1:100.

1984 Patan Durbar Monument Zone, Rehabilitation, Historic Preservation, Presentation, UNESCO, Paris

In January 1984 Eduard F. Sekler led a mission to assess the problems relating to preservation, restoration, and the presentation of the Patan Palace. The aim was to assist the Nepalese Government in reviewing and finalizing a plan for rehabilitation and landscaping. Sekler observed in the June 1984 report, "The overall state of the MZ (Monument Zone) is one of steady deterioration from the point of view of cultural heritage conservation."

The report recommended a ranking of monuments to prioritize restoration, but no specific recommendations were made for the conservation of the palace wings. The mission's primary immediate achievement was to avert the demolition of the Kot Pati and its "replacement with a much taller building of entirely unsuitable modernistic design".

1987 Urban Design at Patan Darbar Square: A Preliminary Inquiry, Eduard F. Sekler
Heritage of the Kathmandu Valley, proceedings of an international conference in
Lubeck, June, 1985, VGH, Sankt Augustin

Sekler's paper was the first published analysis of proportional systems in the composition of the Patan palace and the adjacent square. The study was based on the assumption that the size of each building, placement, and relationship to the whole urban composition was carefully executed with the application of geometric systems.

1991 Conference: Functions and Compatible Use of Old Palaces in Asia
Goethe Institute, Kathmandu

Organized by the Goethe Institute (German Cultural Institute) palaces and various projects were presented from India, Pakistan and Bhutan. Katsuhiko Watanabe presented the case of the Patan Palace analytically without addressing problems of conservation and restoration.

1992 The World Heritage Site - Monument Zone: Darbar Square
Patan Conservation and Development Program

The Patan Conservation and Development Programme under the aegis of UDLE (the Urban Development Through Local Effort) programme of GTZ (German Organization for Technical cooperation) presented preliminary proposals for improvement in December 1992. Extension of the boundaries of the Monument Zone was proposed while problems of building controls were addressed. No conservation recommendations were made for the Palace structures.

1993 Joint UNESCO/ICOMOS Mission to Kathmandu

The review mission consisted of representatives from UNESCO and ICOMOS in addition to local and international consultants and conservation architects. The aim of the mission was to make a general assessment of the seven Monument Zones in the Valley and to make recommendations on management, and on international involvement in cultural resource conservation.

While the mission's participants unanimously recommended placing the Kathmandu Valley World Heritage Site on the List of World Heritage in Danger, the report stated that the condition of the core of the Monument Zone of Patan was "good" and made no further recommendations for the restoration of the palace.

Despite the unanimous recommendation of the mission the Kathmandu Valley World Heritage Site was not placed on the List of World Heritage in Danger until 2003.

1995 Documentation of Sundari Chowk
HMG/UNESCO/Japan Trust Fund project 536/NEP/71

With financial support from a Japanese Trust Fund to UNESCO Hans Bjønness and a team of Nepalese professionals conducted an extensive survey of the courtyard. The report included a historical background of the Patan Darbar Square, archaeological test pits findings, and a description of the history and significance of the Sundari Cok. The documentation drawings were produced at a scale of 1:10 and published internally at 1:20.

While the report contains extensive documentation and a condition survey, recommendations for conservation were limited to emphasizing the importance of retaining historic fabric during conservation and underscoring the urgency of developing appropriate seismic strengthening strategies and issues of future use. A reduced version of this documentation was included in the "repair schedule" published in 1996. The Sundari Cok has remained closed to visitors since the time of documentation.

1995 Schedule of Repairs for Mul Chowk and Agam Mandir
UNESCO, Paris

Prepared by David Michelmor the report recommended replacing "defective timbers (of the roof) with new sal rafters," supplying "common rafter bearers and fascia timbers to the same size and section as the existing allowing 65% replacement," and replacing 80% of the joists for each story. Replacement of newly (1975) carved pine plank doors with new door leaves "to the earlier pattern" was also recommended. Michelmor surmised that the rear (garden)

elevation “had a Dalan with a timber walkway over it”. “It is proposed to reconstruct the dalan with its associated walkway over inside perimeters. ... Given the tight structural design canon of the Newar architecture it is possible to reconstruct this. ... The roof structure will extend down from the Mul Chowk roof and meet with a traditional Newar latticed front similar to that around the courtyard of Sundari Chowk. The structure is to return around the corner of Mul Chowk to the side of Sundari Chowk as the evidence points to doing it.”

Evidence of an arcade in the rear (garden) facade has not be found. A walkway or veranda might have existed on the first floor to facilitate circulation between offices which were located here but a “walkway” with latticed windows is not found in traditional Newar buildings. To “repair damage to the brickwork” and “wall up unwarranted holes in the brickwork” suggests remedial cosmetic work to a wall that had lost its integrity generations ago.

1995 The behaviour of structures in Nepal: with recommendations for remedial work to the structure of Sundari Chowk, Patan Durbar Square, by David Yeomans, University of Manchester

The report presents a detailed analysis of the structural behavior of the Sundari Cok and discussed recommendations made for seismic strengthening. Recommendations include in situ masonry consolidation with injected clay mortar. “Apart from the floor joists that are in some cases substandard, the stresses in material are low and that if the floor is constructed to act as a diaphragm under earthquake loading the stresses within it will be low compared with the working stress for timbers.”

1996 Schedule of Costings for Works to be Undertaken to the Building During Conservation and Restoration of Sundari Chowk, UNESCO, Paris

The report, prepared by David Michelmore who acted as an International Technical Adviser to the Kathmandu Valley World Heritage Site from 1995-96, was intended to provide, “a practical guide and means of establishing costs for a conservation project” and “to record the detailed interventions planned in order to preserve authenticity”.

Michelmore contended that all layers of construction including the makeshift post-earthquake repair dating to 1938 as authentic. Restoration of the historic roof to include the small “*jhingati*” roof tiles and tight spacing of rafters and joists was considered “a change to the present fabric” but could be justified on the basis of a “cosmetic argument” because *jhingati* tiles were used “when the palace was built” and constitute “a higher quality form of roof covering.”

Research “into the structure and history” of the building “can be preserved in the form of a

written record rather than being imposed on the structure of the building”. Thus, the removal of later partition walls which document the more recent use of parts of the building as a jail was also conceded. Due to a lack of documentation or evidence however, Michelmore advised that the original plan of the upper stories is not recoverable.

Despite the concession on roof restoration, Michelmore recommended, “on the ground of costs and good conservation” the retention of the rough terracotta window cornices on the east facades. Window lattices of “sub-standard” workmanship and material, however, should be replaced. While the report recommended tile flooring to withstand the wear of visitors, it urged the retention of mud plaster walls. In order to improve circulation to the upper floors the report also recommended the replacement of missing staircases. Glazed shutters were to be installed to improve security.

The repair scheme presented in the report assumed complete replacement of the roof rafters with narrowly spaced (22,5 cm centres) sal roof rafters and preservative treated planks, clay, and traditional tiles. The replacement of only 15% of the joists was assumed and these were to be pine spaced at 30cm and topped with pine boards and two layers of diagonally laid sal boards fastened with stainless steel screws. Joists were to be fixed to wall plates with non-ferrous Unifix bolts. Recommendations also included retention of all floor tiles and 17th century planking, the resetting of the three tympana above the north arcade, the removal of the shop front at the south and reconstruction of the plinth, and the underground concealment of modern light, electrical and telephone wiring. Proposed major interventions included the replacement of missing carved ivory elements. Detailed instructions for the repair of each strut, window, and shutter was included but instructions for the conservation of the historic brick fabric were surprisingly more general. The report simply instructs, “cut out and replace decayed dachi appa bricks.” In many cases a decision to retain or replace historic fabric is left to the site overseer as in, “examine the lintel over the doorway and replace if necessary.”

The total cost is estimated at \$234,000 with an additional \$67,000 for reporting and training. The repair schedule does not present a historical overview and does not present an analysis of the drawings. The numbering system applied to the windows allows the reader to identify the interventions proposed, but the drawings are not presented to facilitate the “reading” of Newar architecture and principles of design. In an important statement, the author identifies “sub-standard craftsmanship and material” as a justification for replacement. The Mission fully agrees with this justification but the term “sub-standard” is certainly subjective and open to various considerations and will have to be more rigorously examined. The Mission would not only recommend, for example, repairing “the brickwork in all four niches” on the ground floor level of the courtyard, but replace the clumsily carved deities of the niches placed there in 1975. A single surviving 17th century deity sets the standard for high quality replacements. To retain the 1970s carvings as “authentic” contributions seems unacceptable.

1997 Patan Heritage Conservation Actionplan (Masterplan), by Sanday Kentro Associates (Kathmandu), published in 1998 as an assignment by the Patan Conservation and Development Project.

The report ostensibly proposed “revolutionary ideas to protect and regenerate the old spirit of the city core”, but predominantly addressed the problem of building controls. For Sundari Cok the report recommended housing offices of heritage organisations (“valuable tourist centre”) and public activities, and on the second floor a “Museum for Traditional Architecture and Community Settlements”. The renovation budget for Sundari Cok was estimated at \$225,000. For Mul Cok the report recommended “short term functions” such as “traditional dance, theatre and music,” and an “archaeological exhibition centre”. The renovation budget for Mul Cok was estimated at \$180,000. The Bhandarkhal garden was to provide space for a “Sculpture Garden” with and an “Open Air Stage” at the central pavilion as well as a “Seminar and Conference Space”. The Conservation Laboratory was to be relocated and the building converted into a market for food and craft sales. Finally an aviary was proposed for the forested north section of the garden. The budget for the Bhandarkhal was estimated at \$185,000.

2000 UNESCO High Level Mission, Kathmandu Valley, September 24-29.

Taking into consideration the numerous deferrals of the decision by the World Heritage Committee to inscribe the Kathmandu Valley on the List of World Heritage in Danger, a six member High Level Mission from UNESCO Headquarters visited the seven Monument Zones that make up the Kathmandu Valley World Heritage Site. The panel of delegates, including the Chair of the World Heritage Committee and Director of the World Heritage Centre were granted an audience with His Majesty the King of Nepal, the Prime Minister, and other senior government figures.

The question occupying the Mission was whether some of the unique features of the Kathmandu Valley World Heritage Site had been degraded to such an extent that the Site should be given special “in danger” status.

2000 The Japanese Trust Fund at UNESCO,

Money for work at the restoration of the Patan Palace was earmarked from the late 1980s was officially withdrawn for lack of implementation partnerships. No official public record is

known to document the reasons for the withdrawal of funds.

2003 The World Heritage Committee includes the Kathmandu Valley World Heritage Site with its seven sub-sites on the List of World Heritage in Danger.

2004 Restoration of the Court Building, by the Department of Archaeology

While the Post Office was removed and a new roof was installed the structure remains unused. Currently the operation of salt sellers at the arcade has caused deterioration to the traditional lime finish.

2005 Bhandarkhal Garden Integrated Development Project
Proposal by SAFE Consultancy, prepared for the Department of Archaeology

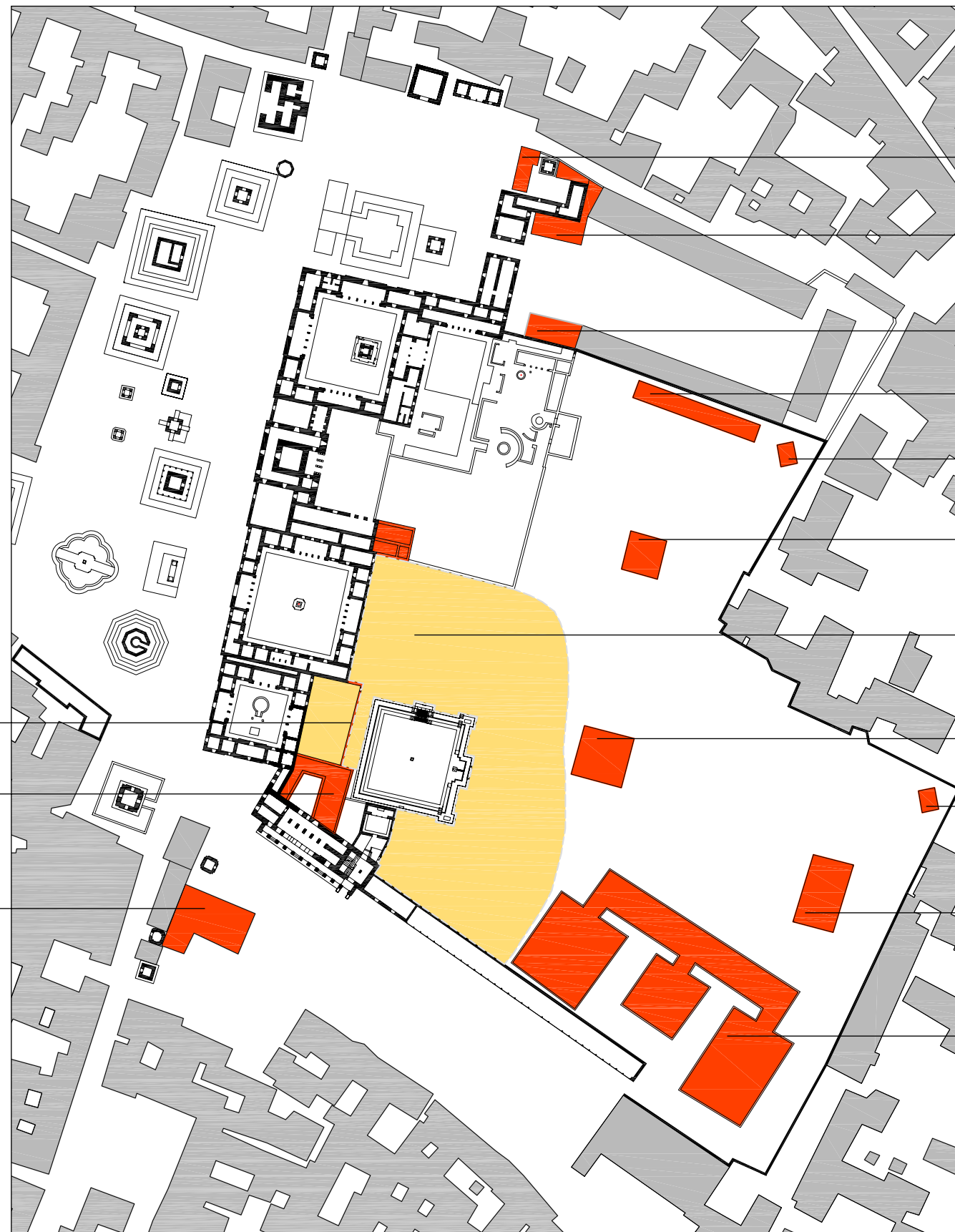
The project proposed “to revive the garden without altering its existing essence”. The proposal envisions “a need to redevelop the garden for people of all walks of life, whether locals or foreigners ... as an oasis in a concrete jungle”. Like Sanday’s masterplan the project recommends that the existing central pavilion “should be used for important activities”, as an open air stage. “A simple landscape with lawns and trees is appropriate”. The overall budget for the project was \$100,000.

2006 Listing of “The Patan Royal Palace Complex” as one of the “100 Most Endangered Sites 2006”, World Monuments Fund Watch

“Launched in 1995 in response to increasing threats to cultural heritage sites around the globe, the World Monuments Watch is WMF’s flagship advocacy program. Announced every two years, the World Monuments Watch list of 100 Most Endangered Sites calls international attention to cultural heritage sites around the world threatened by neglect, vandalism, armed conflict, or natural disaster.”

“Today, the Patan Palace is in a state of advanced decay. Nepal’s Department of Archaeology, although expanding its capacity, lacks the expertise and resources to conserve and maintain the site. The traditional roof and stone elements of the palace are in urgent need of conservation to arrest water infiltration and structural settlement.”

The historic monuments of the Kathmandu Valley, including Patan’s royal palace, were placed on UNESCO’s World Heritage in Danger List in 2003, citing the threat of uncontrolled development.



Object # 11: Boundary wall built of brick and lime mortar

Object # 12: make shift construction housing police till 1994, since then abandoned

Object # 13: post earthquake construction. Previously housed Municipality offices, since 1994 police post

Object #01: illegally built one-story structures and Boundary wall - previously used for a restaurant

Object #02: extension of school building butting up against the 17th cent. shrine building - built without permit

Object #03: one-story concrete and brick shack used for classrooms - ownership unclear, built without proper permit

Object #04: storage shack for stone fragments and materials for Patan Museum garden maintenance

Object #05: brick shack with tin roof, filled with garbage

Object #06: brick and storage shack, mostly empty, some garbage

UP TO 1.5 METER THICK LAYERS OF DEBRIS DEPOSITED AFTER THE 1934 EARTHQUAKE

Object #07: concrete and timber pavilion with collapsing roof, (built for King Birendra's coronation)

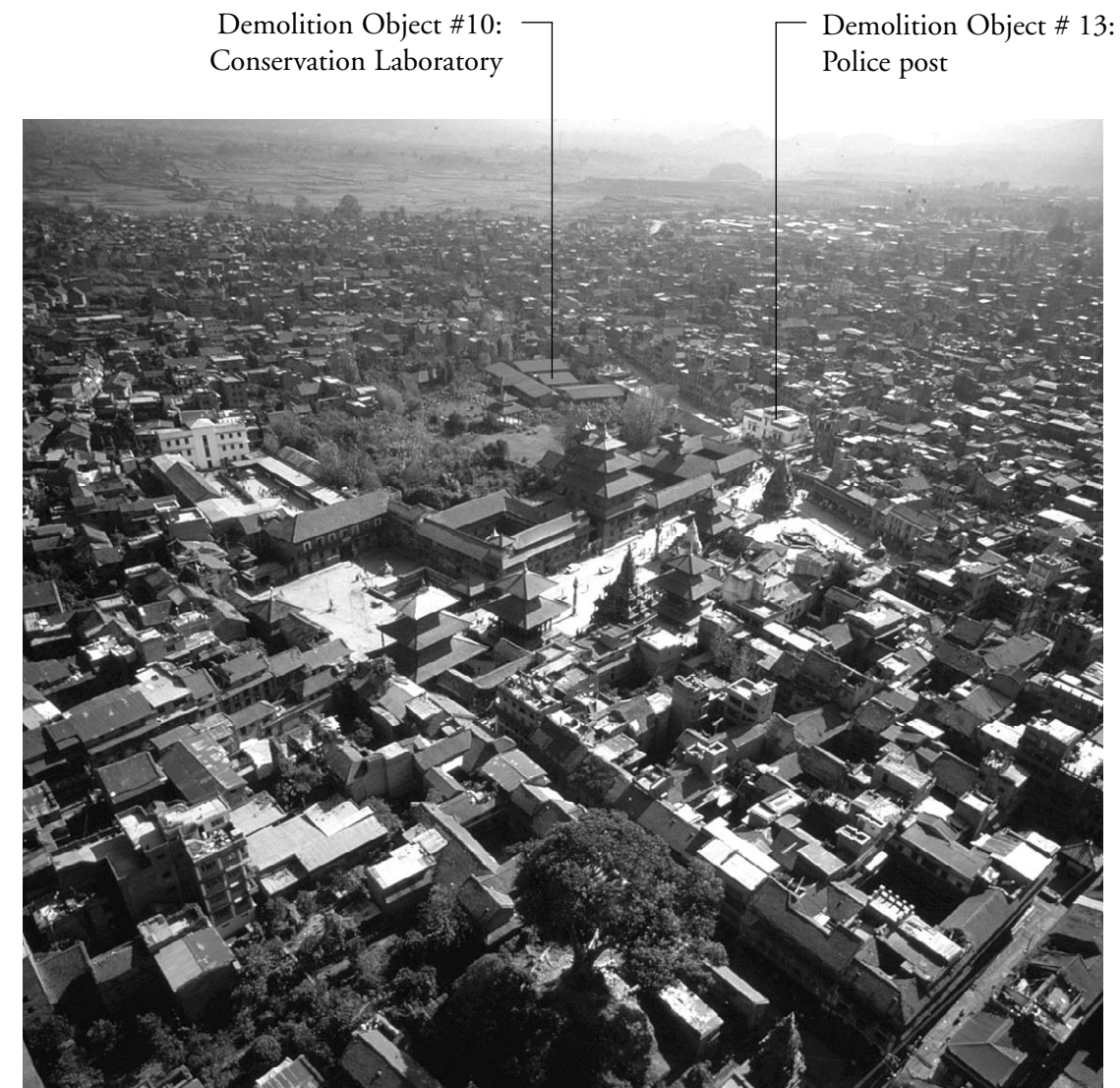
Object #08: shack filled with broken furniture and garbage

Object #09: storage shack for stone fragments and broken furniture

Object #10: Conservation Laboratory

APPENDIX 2

PRELIMINARY DEMOLITION PLAN



Aerial view of Patan with the Royal Palace Complex and garden at its center
This photograph illustrates how densely the urban core area has been built up. Today, 20 years after this photo was taken, many new multi-story structures have been added. The fields in the background have since made room for new residential construction.

Photograph Robert Kostka, November, 1986

Numerous recent structures are possible candidates for demolition in the proposed Conservation and Management Plan. These are generally structures built for government offices such as the Department of Archaeology's conservation lab or the Patan municipality building that was later converted into a police station. These are constructed in arguably incompatible design and materials and may compromise the site. One structure that is in imminent danger of collapse is a pavilion constructed in honor of the late King Birendra's coronation in the mid 1970s.

Strategic planning must be explored to review the possibility of demolition or selective retention. While the mundane structures built for government offices and the Department of Archaeology's conservation lab may not be compatible with the richness of the palace structures they could serve a temporary use for storage, staging, and laboratory space while conservation work takes place. The following pages document the various structures that may be proposed for demolition.



Object #01: one-story structures built illegally around the small Shiva shrine. After demolition there will be public access to the temple and the 17th century agam building.



Object #02: extension of school building butting up against the 17th century shrine building and the North wing. A compromise could be found with the school to support construction of additional rooms in the main courtyard in exchange for demolishing this inappropriate structure.



Object #03: one-story concrete and brick shack used for classrooms.



Object #05: brick shack with tin roof, filled with garbage



Object #06: brick and storage shack, mostly empty, some garbage



Object #04: storage shack for stone fragments and materials for Patan Museum garden maintenance



Object #07: Concrete and timber pavilion with collapsing roof, (built for King Birendra's coronation)



Object #08: Shack filled with broken furniture and garbage



Object #09: storage shack for stone fragments and broken furniture



Object #10: Conservation Laboratory
This Government office is basically unused - relocation of the laboratory should be considered.



Object #10: Gate to the Conservation Laboratory



Birds eye view of Demolition Object # 13: Police Station
To the left the Court Building, in the background garden and Kot pati



View of Demolition Object # 13 from Darbar Square
The South-West corner of Sundari Cok on the left and a modern 7-story building on the right.



Demolition Objects # 11 and #12:
The rear wall of the abandoned police post and the new Boundary wall behind the tank. Note the grade level around the tank which is now 4-5 feet higher than it was 150 years ago.



Demolition Object #12:
This make-shift construction previously housed the Mangal Bazar Police Post. It has been abandoned since 1994 and is now occasionally used by squatters.