

RESTORATION OF THE PATAN ROYAL PALACE COMPLEX

MULCHOWK PALACE
KOT PATI
STONE GATES
BAHADUR SHAH WING

AFCP 2009 LARGE GRANT - 2012 EXTENSION

AWARD # S-NP-400-09-CA-029-A02
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FINAL REPORT

SUBMITTED BY THE KATHMANDU VALLEY PRESERVATION TRUST

MARCH 2014



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Note on the organization of this report: This Final Report per AFCP's request is structured as an extension to the Large Grant Final Report (January 2013) and subsequent progress reports. The present report focuses solely on activities undertaken under the 2012 Extension to the 2009 Large Grant.

REPORT NARRATIVE

With support from the 2012 grant extension, the four remaining building components (Mulchowk, Kot Pati, Bahadur Shah, and Stone Gates) of the Patan Royal Palace Restoration & Conservation Project have been successfully completed. KVPT is pleased to note that all four project components have been completed on schedule and all four buildings are now open and accessible to the public. Now that all restoration and conservation activities of the extension phase are complete, KVPT continues to work in collaboration with the Patan Museum and the Department of Archaeology to ensure proper maintenance and management. The self-sustaining model of the Patan Museum will be extended to the entire palace complex to generate necessary income without being a burden to government funding.

MULCHOWK

90% of Mulchowk was already completed with the help of the 2009 grant. Since 2012 the historic courtyard paving, interior wall plastering, electrical installation, and floor finishing were completed in time for the Kathmandu International Art Festival in November 2012 which used the newly restored first floor galleries as an exhibition space. A preview of the planned permanent exhibitions of the Architecture Galleries is set to open on the first floor of Mulchowk in March 2014.

KOT PATI

The 2012 grant extension supported the completion of the two remaining components of Kot Pati - the terracotta tile flooring and the addition of an entry room through the center of the building. The tile paving using *telia* terracotta tiles in lime and brickdust mortar (*surkhi*) was completed with the help of the 2012 grant extension. The ten-foot gap in the center of the rest house that was previously used for the supply of construction materials to the site was developed as a gate to the palace complex. Timber panels, tiling, and security bars were installed. Meanwhile, the rest of Kot Pati, previously obscured by tin partitions, was opened for public use as a continuous long arcade.

STONE GATES

The two stone gates on the western façade of the palace between Mulchowk and Keshav Narayan Chowk have been fully restored after extensive documentation and analyses of the individual stone sculptures. The stone sculptures were reassembled and installed in their original locations, after which they underwent cleaning and treatment *in situ*. KVPT benefited from the expertise of visiting stone conservators from the University of Applied Arts Vienna who worked alongside local craftspeople to repair and clean the stone sculptures.

BAHADUR SHAH (NORTH WING)

The restoration of the Bahadur Shah building, the north wing of the palace complex, was completed on schedule. Restoration and repair of this relatively intact building included strengthening of the existing roof structure, removal of incompatible paint, major repair of damaged balconies and railings, replacement of mismatched *telia* tile flooring, repair of the brick façade, and conservation of the interior sgraffito friezes. A new electrical and lighting system with audiovisual capability was also installed. The restoration of the large hall provides the museum and the city with its only historic interior space of this scale, to be used as a multipurpose gathering space for local community and neighborhood organizations, as well as visiting international conferences and workshops. The hall is currently the only such space available in Patan's historic zone.



MAJOR PROJECT ACTIVITIES AND ACHIEVEMENTS

All planned activities were successfully completed. To avoid repetition, planned and completed activities are presented in a single list.

MULCHOWK

- The courtyard was re-paved at the historical level (approximately 5-6 inches lower than the modern tile floor dating to 1972) according to careful documentation. 50% of the original bricks were reused and the remaining bricks were ordered from Thimi as per the historic samples. The paving was re-set in the historical pattern, a sophisticated and complex design.
- The same was done on the plinth, where the 1972 paving had caused damage to the stone bases of the timber pillars. The plinth was repaved with traditional floor tiles (*chikah-apa*) in lime *surkhi* mortar.
- Terracotta floor tiles were placed in all rooms of the first floor.
- Electrical systems were installed in the first floor.
- All walls of the first floor were plastered using traditional black clay and painted white for exhibition purposes.
- An interior museum lighting system was installed on the first floor.
- New partition walls were built to divide exhibition spaces within the first floor halls.

KOT PATI

- The floor was completely paved using traditional terracotta *telia* floor tiles in lime and brickdust mortar (*surkhi*).
- Two timber partitions were added to delineate the entry room in the middle of the arcade.
- Metal security bars and folding wooden panel windows were designed and installed in the new entry room.

STONE GATES & COURTYARDS

- Portland cement in-fill was removed from the brick wall fabric .
- The heavily damaged walls in which the gates were set were reconstructed using both existing and new bricks.
- The brick paving of both courtyards was excavated and re-set in the traditional configuration.
- The staircase of the north courtyard was repaired, plastered, and painted.
- Stone sculptures were carefully cleaned and treated after reassembly with the help of a conservation team from the University of Applied Arts Vienna.
- The stone sculptures were cleaned with state-of-the-art laser technology to clean the deep-set layers of dirt and black tar. Years of careful testing of different solvents did not yield the expected results, which necessitated the use of the laser.

BAHADUR SHAH (NORTH WING)

EXTERIOR

- Damaged veneer bricks (*daci apa*) on the east and west façades were removed and replaced with matching salvaged historic (*daci apa*) bricks laid in yellow mud mortar.
- The water tank adjoining the south-east corner of the building was removed.
- Sewer and rainwater drainage was improved by re-installing cement pipes at the correct depth and angle.



- New manholes were constructed to facilitate cleaning and maintenance.
- The modern plinth on the west façade was completely dismantled and replaced with a properly designed plinth employing a stone edge and traditional paving tiles (*chikah-apa*).

GROUND FLOOR

- Cement plaster from interior walls was completely removed and all concrete floors were dismantled.
- Flat brick soling was installed as a base layer and floors were paved re-using approximately 50% of historic floor tiles. Damaged tile was replaced with newly fabricated tiles that matched the historic shape and color. For increased strength and durability the floor tiles were laid in a lime and brick dust mortar (*surkhi*) rather than the traditional mud mortar.
- Trash and debris were removed from rooms and properly disposed.
- The severely damaged door panel and inner door frame were completely replaced.

FIRST FLOOR

- Cement plaster from interior walls and floors was removed.
- Ceiling joists were thoroughly cleaned, removing all modern oil paint and dirt.
- Steel plates were installed to firmly connect columns, corbels, and beams to withstand seismic movement.
- New stair opening frames were installed to replace rotten ones. Stair railings were repaired and lost elements were reproduced. The existing stair was then properly reinstalled.
- Traditional floor tiles (*chikah-apa*) were used in the re-paved stairwell and lobby area.
- Damaged mud plaster was repaired. Careful attention was paid to preserve as much of the original plaster work as possible, and areas were patched only where original fabric had been lost.
- Lost window railings were reproduced and installed.

SECOND FLOOR

- All damaged cabinets under the windows were restored, and all missing panels and interior planking was replaced.
- All windows were completely restored. Missing slats from the louvers were replaced and damaged frames and panels were professionally repaired.
- The stair openings received entirely new frames as the existing ones were damaged beyond repair. The staircases needed some repairs and were securely re-installed.
- Missing balcony railings were reproduced following historic examples.
- Staircase, lobby and main hall were paved with traditional floor tiles (*chikah-apa*) in a lime and brickdust mortar (*surkhi*).
- Mud plaster was applied to the walls.

ATTIC

- All mud was removed from the attic floor and disposed to reduce the excess weight on the ceiling, improving the building's seismic performance in the event of an earthquake.
- A few pieces of ceiling planking were found damaged and replaced with new hardwood planks.
- The entire attic floor was covered with an additional layer of marine grade plywood. 4' by 8' plywood sheets were installed in a staggered layout and firmly nailed to the planking and ceiling beams underneath, forming a strong diaphragm providing extra strength to the building in case of seismic movement.
- Metal tie braces were added to support the rafters.



IF THE PROJECT TURNED OUT DIFFERENTLY THAN PLANNED, AN EXPLANATION FOR WHY THAT WAS THE CASE

The present grant extension was largely necessitated by the fivefold increase in the cost of timber. With the help of the 2012 grant extension, all targeted project components of the project were completed on schedule and according to plan, with the exception of minor unforeseen situations that came up during the restoration process:

- KVPT had initially planned to replace the lime plaster flooring of Kot Pati with wood, but soaring timber prices prompted the use of terracotta *telia* tiles instead. This was an appropriate solution since tiles would not betray the building's authenticity as they are often used in historical rest-houses as a substitute for wood. Moreover, tiles last longer and are more suitable for a variety of uses than wood flooring, which requires more maintenance.
- The initial restoration plan for the Bahadur Shah building foresaw the reconstruction of the plinth at its historic level. However, it was not possible to restore the plinth to this level without lowering the paving of Darbar Square, which has been raised over time to 14" above its historical level. Since such an undertaking was beyond the scope of the project, KVPT decided to restore the plinth at its existing level using new edge stones and terracotta tiles.

DESCRIPTION OF MAJOR COSTS INCURRED DURING THE REPORTING PERIOD

Please see attached financial documentation.



PROJECT OUTCOMES, BOTH POSITIVE AND NEGATIVE

MULCHOWK

All four buildings have been completed on schedule and are now open to the public. Mulchowk's first floor now hosts the Architecture Galleries, an exhibition under development that focuses on the architectural language of the Kathmandu Valley. Windows, columns, struts, and tympana are displayed in a typological order and accompanied by drawings and written commentary explaining both their iconography and their significance in the context of Nepali and global architecture. Visitors to the Galleries will also be able to access the Vidyapith (Sanskrit: "learning room"), an esoteric shrine in the west wing of Mulchowk that was conserved during the restoration process. The room dates to the 17th century and is a rare example of Malla-period interior architecture. The north wing will be developed with additional displays, rotating temporary exhibits, and a media room after the necessary funds are raised.

These galleries are an extension of the Patan Museum, Nepal's most successful cultural institution. Income generated through ticket sales provide a sustainable management model, ensuring the continued accessibility of the palace complex to the public.

KOT PATI

The restoration of Kot Pati has recovered its original form and function as a public arcade and rest-house. However, the building cannot be utilized to its full potential until the parking lot on the adjacent square is relocated. It is hoped that the restoration of the building will provide added incentive for the municipality to relocate the parking lot so that the square is more welcoming to pedestrians and visitors.

STONE GATES

The restored stone gates and their adjacent courtyards are an added attraction to Patan Darbar Square and have proved popular with locals and visitors alike. Careful restoration has ensured the continued protection and preservation of the rare stone sculptures of the two gates. The south courtyard forms a unique enclosure between the square and the recently opened Mulchowk courtyard. This courtyard with its stepped platform can be utilized for a variety of public activities of a relatively small scale.

BAHADUR SHAH (NORTH WING)

The restoration of Bahadur Shah has made this building available for multiple uses. The large hall on the second floor was used as a lecture hall for an ICOMOS conference in December 2013. Having been fully refurbished and with audiovisual capability, it is an ideal setting for performances, film screenings, and a variety of other activities.



Patan Durbar Square gets facelift

SAMIK KHAREL
KATHMANDU, NOV 28

After four years of hard work, Mul Chowk, the central courtyard of the Patan Durbar Square, has been restored to its original grandeur with the support from the US Ambassadors Fund for Cultural Preservation.

According to officials involved with the restoration project, over 75 percent of the work has already been completed in the palace area while other restoration works are being carried out. "The Eastern gate, Bahadur Shah's palace, among others, have been restored," said Rohit

Ranjitkar, Nepal Program Director of Kathmandu Valley Preservation Trust. The other components which need restoration include the Royal bath and Sundari Chowk which fall under the Patan palace complex.

The (AFPC) extended a financial support of \$1.1 million for the project. Over 100 craftsmen were involved with the restoration process every day for four years.

Six months ago, artefacts and treasures dating back to the Malla period were discovered at the Mul Chowk section of the palace. Over 200 antiques were extracted by a team of experts during the



■ Patan Durbar Square

renovation work at Mul Chowk. Chambers where the antiques were recovered had remained closed for over 50 years. The chambers were located to the southeast and west lawns of the courtyard.

The three chambers were used as Bidhyapeeth, secret rooms where the royal

palace's Rajopadhyay priests performed Tantrik practices.

Along with utensils, 200 other artefacts including wooden and iron-cast statues were discovered from the Mul Chowk compound. Among the antiques recovered are ancient coins, brass plates, bronze karuwa (a small water vessel), glasses, torans (decorative metals used in ancient palaces) and garlands of deities. According to officials, a gold-plated Sri Yantra (highly valued crystal said to attract positive energy), and a pendant of sphatik (a crystal triangle used in worshipping the deities on special occasions) are the two priceless

objects recovered during the renovation. Also found in the courtyard were a number of centuries-old statues carved in wood and iron.

Department of Archeology officials said the inventory of the utensils had been completed and that they were listing the statues and other valuables collected from the storehouse of Patan Museum over the years. The officials plan to put the valuables on public display in Mul Chowk soon. Preservation works at the Royal Bath and Sundari Chowk of the Patan Durbar Square are being jointly carried out by the KVPT and the DoA.

Patan Royal Palace restored with US aid

Himalayan News Service
Kathmandu, December 2

A US-funded project has completed the restoration of the Patan Royal Palace.

Conservation experts, government representatives and members of the diplomatic community took part in an event held yesterday to celebrate the completion of the project, a model for cultural representation worldwide.

The US Ambassador's Fund for Cultural Preservation had provided \$1.1 million for the preservation of the historic site.

US Ambassador Peter W. Bodde said on the occasion, "The Ambassador's Fund is among the US government's

most significant cultural initiatives abroad. It makes me very proud as an American to know that my country supports and protects conservation efforts like this one around the world."

Bodde and other US Embassy officials congratulated the local community and the fund's partner, Kathmandu Valley Preservation Trust, for the project's success.

The Patan Royal Palace conservation project had competed for an Ambassador's Fund award in 2009, under a special large grant competition. Nepal, Peru and Macedonia had received the grant.

Since 2003, the ambassador's fund has supported 15 projects in Nepal.

The Kathmandu Post, 28 Nov 2013

The Himalayan Times, 2 Dec 2013

US envoys' Fund helps Patan Mul Chowk regain its former glory

SAMIK KHAREL
KATHMANDU, DEC 1

In the sixteenth century, the Patan-based priest and poet Kuru Sharma, in his book Kirti Pataka, described the beauty of the Patan Palace Mul Chowk (main courtyard) as a "piece of heaven on earth". For years this heaven was in a dilapidated condition following fires and frequent earthquakes. But now as the gentle wind blows, the small bells hanging at Debu Tale temple create sonority complementing the acoustics of the recently restored Mul Chowk, reviving back its heavenly status.

Four hundred years ago, this palace courtyard was built by Malla King Shree Niwas, son of Siddhi Narsingh Malla. While

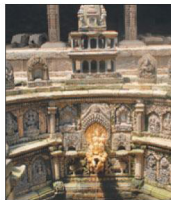
Siddhi Narsingh avoided the conventional construction of building the main courtyard, his son Shree Niwas envisioned the necessity of a main courtyard for his palace. "After that Mul Chowk was used for sacred and sacrificial purposes," said architect and researcher Dipak Pant. "The major disaster at Mul Chowk was when the Debu Tale temple was brought to ground with fire and the 1954 earthquake."

The restoration which took nearly four years of intense work by skilled craftsmen and experts was funded by the US Ambassadors Fund for Cultural Preservation (AFPC) under the special large grant of 1.1 million dollars. On Sunday, amid a special ceremony to celebrate the completion of the Mul Chowk

restoration project, US Ambassador to Nepal Peter W. Bodde said that helping to preserve the heritage was equally important. "The Ambassadors Fund is among the US government's most significant cultural initiatives abroad. It makes me very proud as an American to know that my country supports and protects conservation efforts like this one around the world," said Bodde.

Nepal was one of three countries with Peru and Macedonia selected to get large grants for preservation. In 2006, Patan complex figured on the World Monuments Watch List of 100 most endangered heritage sites.

Officials involved in the restoration project confirm that over 75 percent of the work has



■ Tusahiti at Sundari Chowk

already been completed in the palace area while other restoration works are being carried out. The eastern gate, Bahadur Shah palace and Mul Chowk are

among the components which have already been restored under the AFPC fund. "We are working on restoring the Royal Bath and Sundari Chowk," says Rohit Ranjitkar, the Nepal Programme Director at the Kathmandu Valley Preservation Trust (KVPT), responsible for the restoration of the area.

Sundari Chowk was the resident palace of Siddhi Narsingh Malla which hosts the octagonal Tusahiti in the centre, with a golden dhara (tap). All of this restoration falls under the component of the larger Patan Palace restoration project. Over 100 craftsmen were involved in the restoration process everyday for four years.

Six months ago, artefacts and treasures dating back to the

Malla period were discovered at the Mul Chowk section of the palace. Over 200 antiques were extracted by a team of experts during the renovation work. Chambers where the antiques were recovered had remained closed for over 50 years. They were located to the southeast and west lawns of the courtyard.

The three chambers were used as Bidhyapeeth, secret rooms where the royal palace's Rajopadhyay priests performed Tantrik practices. Bidhyapeeth was also opened on Sunday, decorated with the same artefacts recovered during its opening.

Along with utensils, 200 other artefacts including wooden and iron-cast statues were discovered from the Mul Chowk compound during the conservation. Among

the antiques recovered are ancient coins, brass plates, bronze karuwa (a small water vessel), glasses, torans (decorative metals used in ancient palaces) and garlands of deities. According to officials, a gold-plated Sri Yantra (highly valued crystal said to attract positive energy), and a pendant of sphatik (a crystal triangle used in worshipping the deities on special occasions) are the two priceless objects recovered during the renovation. Also found were a number of centuries-old statues carved in wood and iron.

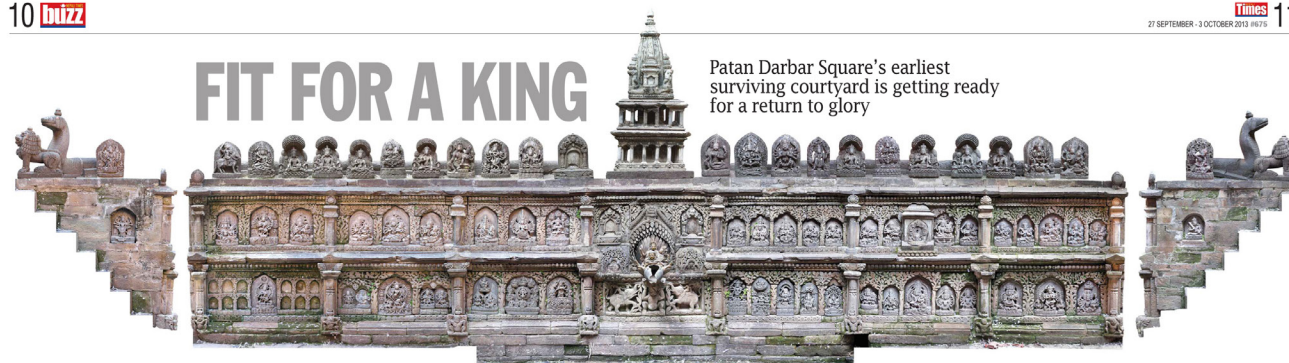
Preservation works at the Royal Bath and Sundari Chowk of the Patan Durbar Square are being jointly carried out by the KVPT and the Department of Archeology.

The Kathmandu Post, 2 Dec 2013



FIT FOR A KING

Patan Darbar Square's earliest surviving courtyard is getting ready for a return to glory



LAWRENCE MILLER

Standing in Sundari Chok at Patan Darbar Square is an experience fit for a king. The ornate and richly iconographic Tusha Hill step well, the large stone slab that once served as King Siddhimanasinha Malla's window bed, the intimate proportions of the space, all transport visitors to another time and place.

Built in 1627 by King Siddhimanasinha, Sundari Chok is Patan Darbar's earliest surviving courtyard and the most finely preserved instance of Malla architecture in the Valley. The medieval quadrangle is also noted for its intimate scale: few places (or palaces) around the world are so evocative of ceremony and gravitas. For its unique atmosphere and its intricate, largely intact relics, Sundari Chok is one of the most important historic sites in the Kathmandu Valley.

Ten years ago, there was no evidence of such reverence. Many examples of the rich iconographic program, largely carved in stone on the lower level of the courtyard, had been looted. Heavy construction during a material

scarcity after the 1934 earthquake left many of the palace walls mired in damp and rot. An entire facade built after the earthquake in no way resembled its adjoining walls. The once sacred courtyard, until 1993, had been set up to house a temporary jail. With support from the German government, the US Ambassadors Fund, the Prince's Charities, Ludwig Katterer, Beatrice Ost, Prithvi B Paudel, and Pratima Paudel, the Kathmandu Valley Preservation Trust (KVPT) set in motion a restoration project that would soon return Sundari Chok to its former glory.

Founded in 1991, KVPT has been restoring historic sites in Kathmandu for over two decades. It is overseen by Rohit Ranjekar and Thomas Schrom along with a team of Nepali staff. The trust works in conjunction with the Nepali government's Department of Archaeology to identify historically significant sites in the Valley most in need of restoration. Notable past efforts include the overhaul of the Kal Bhairab shrine, the Hanuysaha Monastery, and various temples at Kathmandu Darbar Square. The Patan Palace Restoration Plan is the organization's most large-scale project to date and Sundari Chok, its crown jewel.

But the route to restoration is not always a straightforward one. Besides the aforementioned structural challenges, KVPT was faced with a conceptual challenge of the rear wing. Rather than set the wing in a new style, the trust has decided to keep it as a testament to the earthquake. The resulting plan is a balance of authenticity and utility.

For KVPT, quality and user experience rank above all else. "We sometimes get complaints about timing," says Ranjekar. "But they



FACELIFT. Tusha Hill (above and left, here, yet unrestored). The royal step-well is the main focal point of Sundari Chok with its extensive iconographic program. Prior to restoration, many tiles were damaged or missing. The well was not used for bathing, as is sometimes believed, but for the king's religious rites. In 2011, the copper tap was recovered by Nepal Police after being stolen a year earlier. A replica will adorn the fountain while the original will be displayed in a nearby wing as part of a new Architectural Gallery, set to open in 2016.

go away as soon as we're done. But complaints about quality, those are with you for a lifetime." One way KVPT ensures quality is by employing local craftspeople instead of contractors. Going into a restoration, Ranjekar says you don't know what problems you'll find "until you get your hands dirty." Since the trust can't always plan ahead, it pays craftspeople by the day to ensure that they'll address structural problems as they surface. Additionally, Ranjekar visits the site on a daily basis.

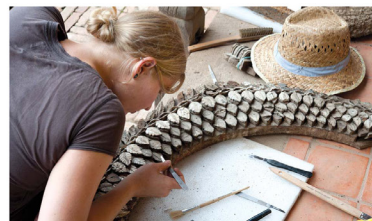
The organization also employs the latest in construction and restoration technology to guarantee the longevity of the projects. As Kathmandu Valley is prone to earthquakes, the staff wants to make sure that in the next 30 to 40 years, the reconstructed sites won't turn to rubble. KVPT has worked with engineers to develop new, non-invasive methods to considerably strengthen the structures against seismic damage. Additionally, in partnership with professors and students from the University of Applied Arts Vienna, the trust employed laser technology at the Sundari Chok to help clean

stone figures and iconic ivory framing. It is through a focus on intricate details that KVPT believes the restored buildings can regain their former stature and splendor.

When the Sundari Chok restoration is completed in 2015, it, along with the recently restored Mal Chok, will become the Nepal Architectural Galleries, an extension of the Patan Museum. While Mal Chok will host exhibitions on the history of Nepali architecture, Sundari Chok will be an exhibit in and of itself. The quadrangle will harken back to its original design as much as possible, up to the mud floors and walls. Visitors will be prompted to take off their shoes to experience the building just as the king once did.

"There's a large bay window in the southeast corner," says Ranjekar. "I want people to sit there and look out over the city just as Siddhimanasinha Malla would have."

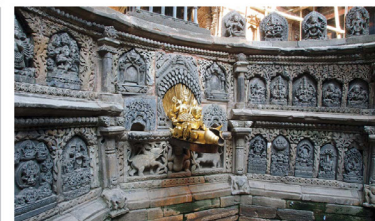
nepalitimes.com
Facelift for the Patan Palace, #654
Before and after in Kathmandu Valley #75
Watch Rohit Ranjekar's talk



The palace was left unoccupied during the Shah reign after 1775. This view shows the southwest corner.



Photo taken this week during mid-restoration. A poor restoration attempt after the 1934 earthquake required entirely new roofing.



Nepali Times, 27 Oct - 3 Sep 2013, #675
See video coverage at www.nepalitimes.com



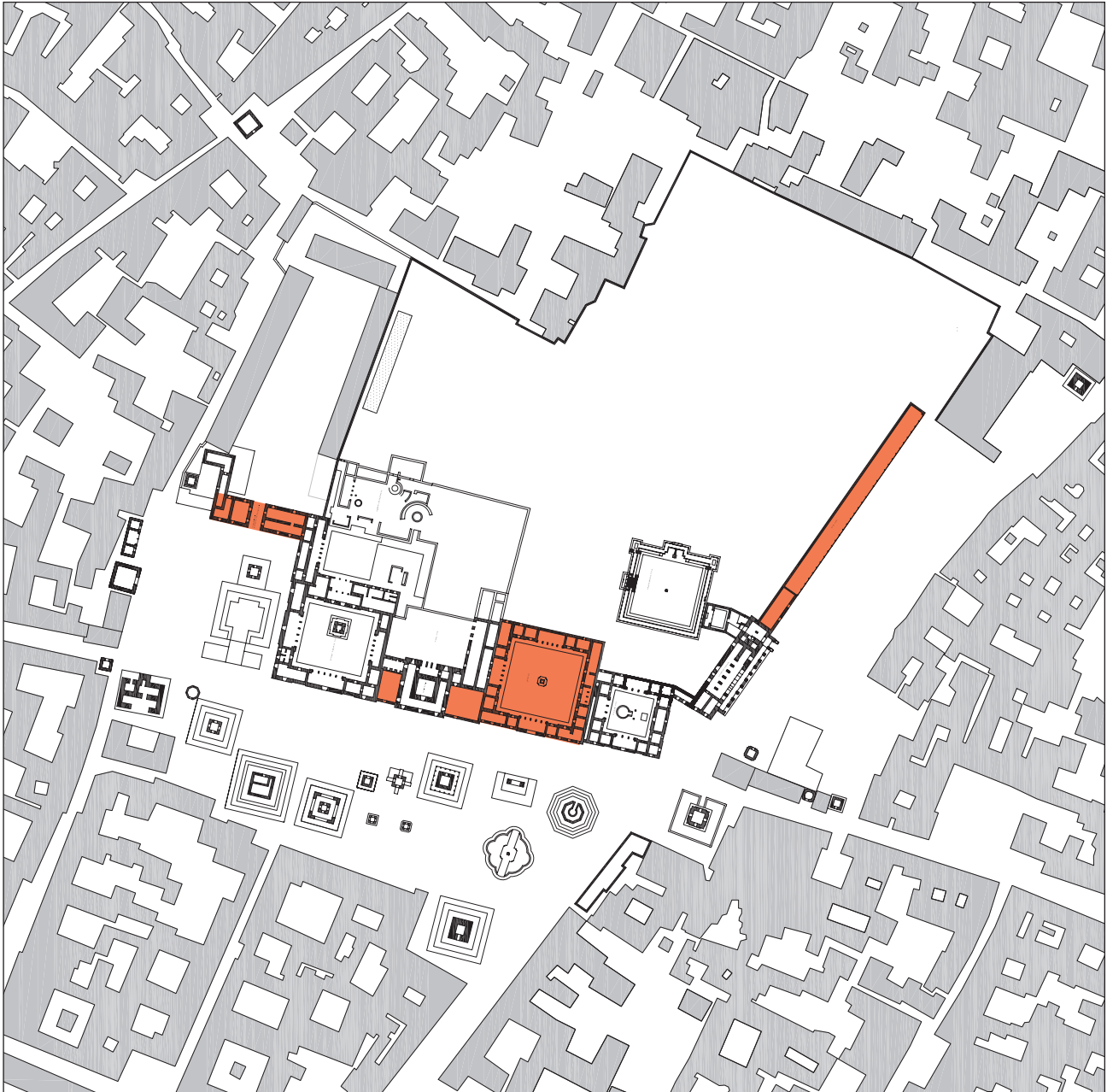
PHOTOGRAPHS, IMAGES, ETC.

BAHADUR SHAH

STONE GATES

MULCHOWK

KOT PATI



Site plan of Patan Darbar Square | 2014

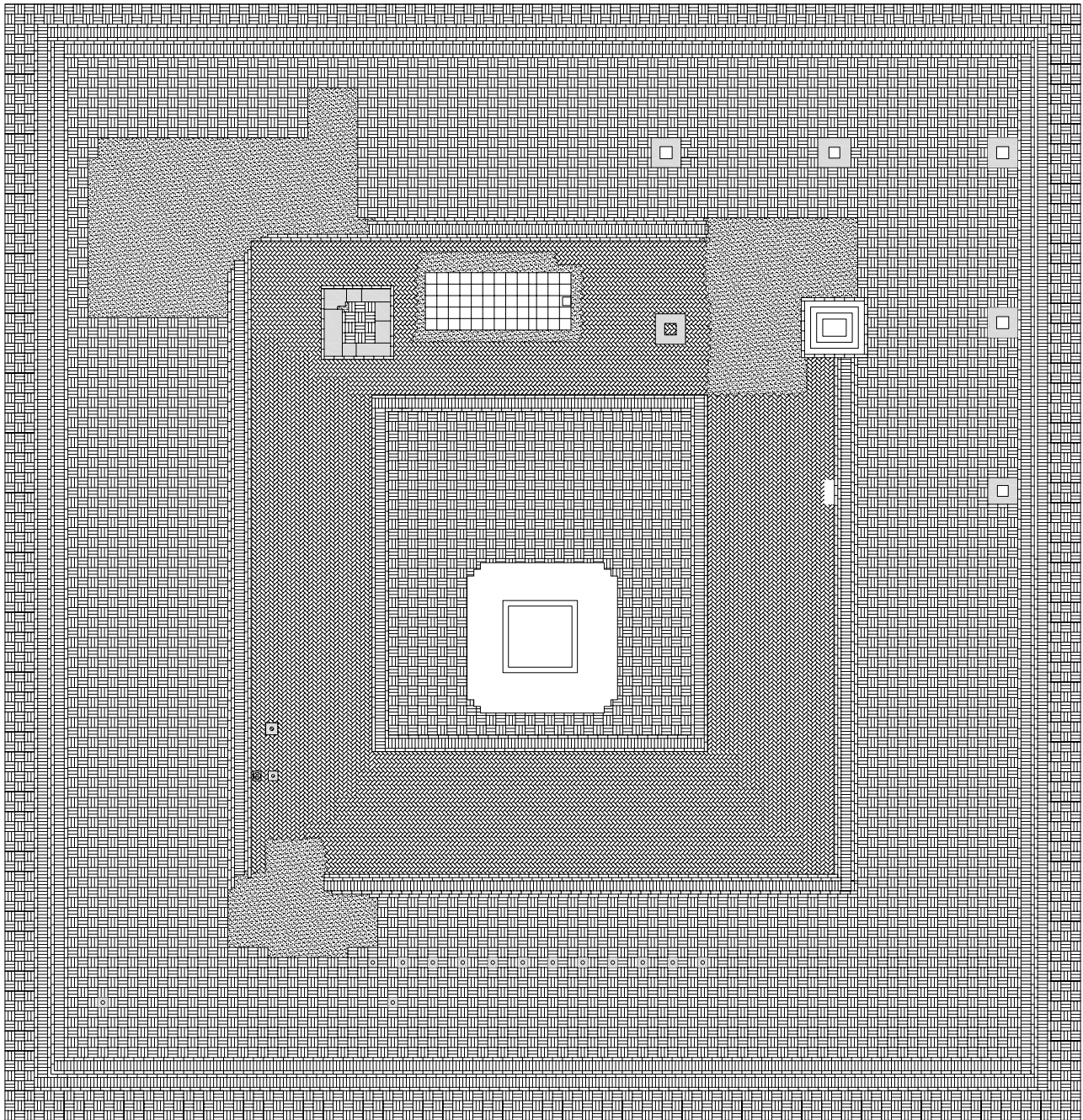
The plan shows project components that were completed with the support of the 2012 grant extension.





Aerial view of Patan Darbar Square | 1979





Plan of historic brick paving

The excavated historic on-edge brick pavement of Mulchowk courtyard was documented and analyzed before an appropriate restoration design was developed.





Restored paving of Mulchowk courtyard | 2012

View of the courtyard paving shortly after its restoration in its historical configuration that was discovered during excavation. The difference in color between historic and new bricks is clearly visible.



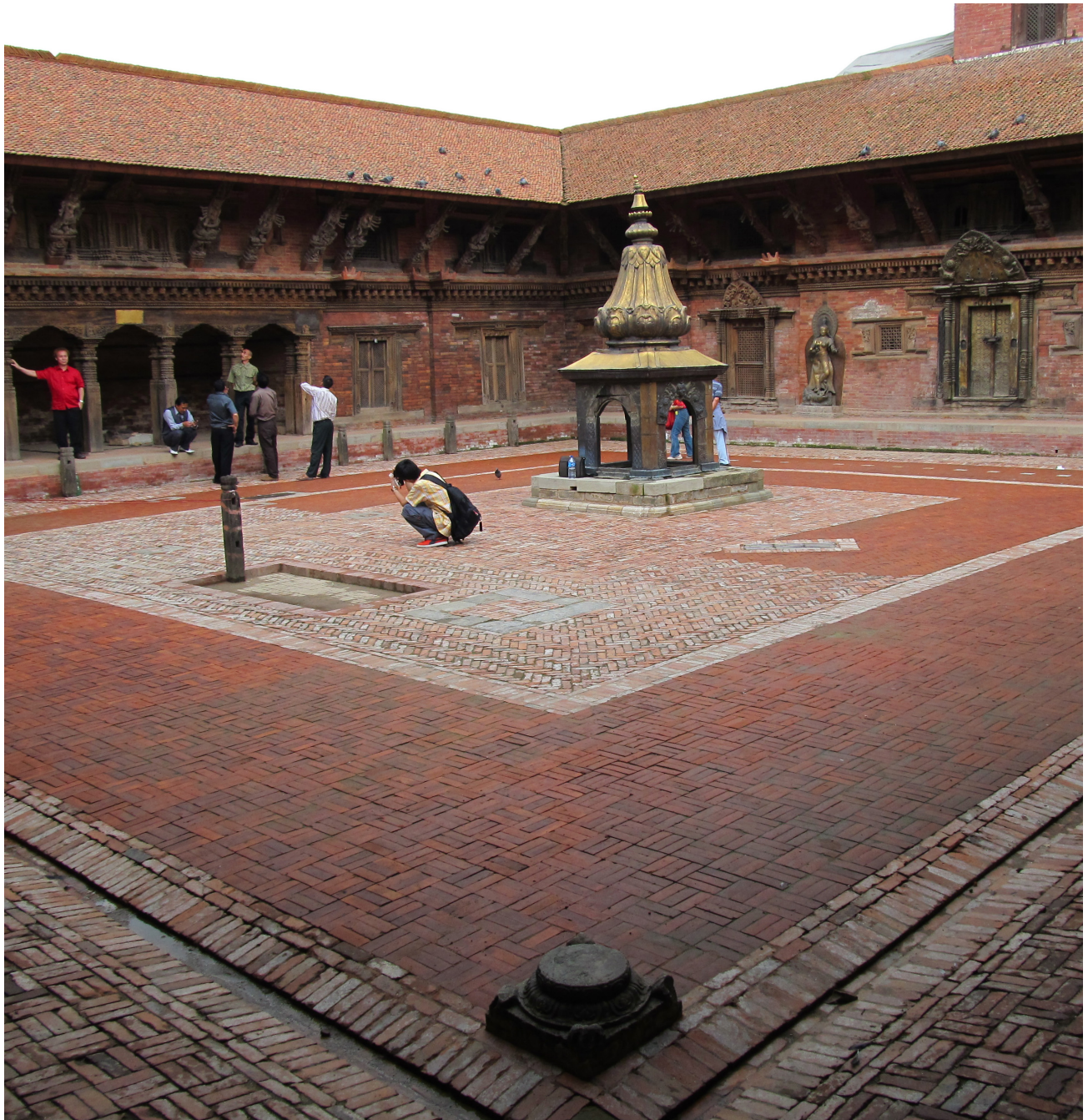


2007



2012





Restored paving of Mulchowk courtyard | 2012

The new courtyard paving was sloped to efficiently channel rainwater out of the courtyard along surface drains. The courtyard restoration included two sub-projects supported by other donors: the Yantaju shrine in the center of the courtyard was restored in late 2012 with support from Lamu Amatya, a Nepali private donor, and the Golden Door (far right) was restored in 2012 with support from the Government of the Federal Republic of Germany, The Sumitomo Foundation, and local craftsmen.





Architecture Galleries at Mulchowk | February 2014
Views of the interior of the first floor of Mulchowk during the installation of exhibits in the Architecture Galleries.







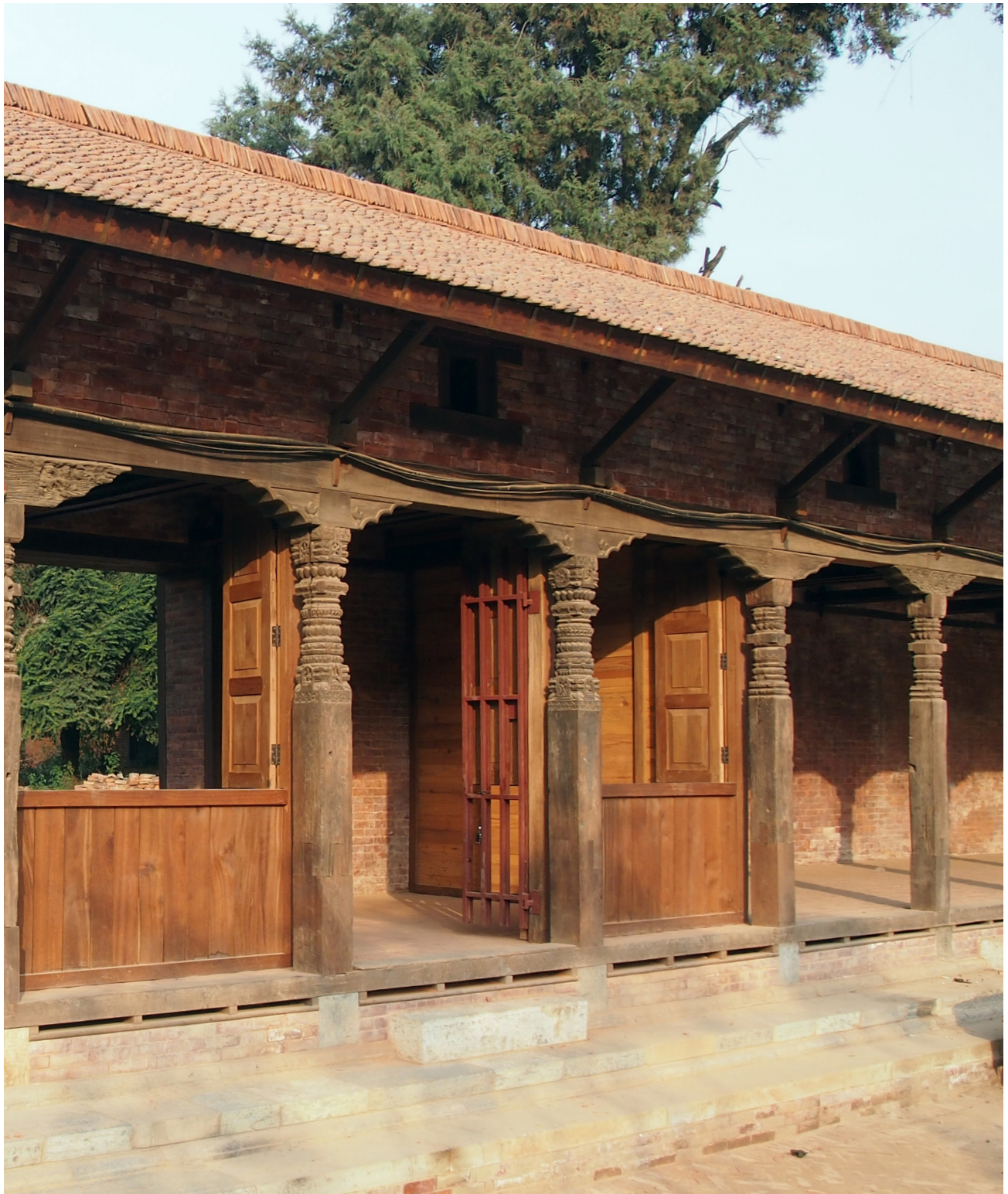
Kot Pati before restoration | 2006

The dilapidated condition of Kot Pati before restoration is clearly visible in this photograph. Makshift doors and partitions were added by shopkeepers with little regard to the building's historic fabric.



Installation of timber partitions and panel windows | March 2014





Kot Pati entry after restoration | March 2014

An entry room to the rear garden behind the palace was created with newly designed timber partitions, panel windows, and security bars. The rest of the Pati will remain a continuous arcade.





North Stone Gate | May 2011, September 2013





South Stone Gate | August 2010, March 2014





Initial cleaning and repair | September 2013

Initial cleaning and repair of stone elements of the south stone gate. The sculptures were heavily damaged by Portland cement infill which had to be carefully removed without damaging the surface of the stone.





Repaired stone image of Vishnu | September 2013
The stone sculptures were fixed to the gate with lime and brickdust mortar (*surkhi*) after cleaning and repair. The left part of this sculpture was recarved.





Laser treatment | August 2013

The sculptures required laser treatment for additional cleaning of deep-set layers of tar paint. Dr. Alessandro Zanini from the University of Applied Arts Vienna was responsible for laser ablation of the individual stone sculptures of the south stone gate. Careful attention was also paid to the patina and joints.





Laser ablation of tar paint | August 2013
The use of the laser enabled highly selective and targeted cleaning while avoiding surface damage.





Chromatic difference after laser ablation | September 2013

The chromatic difference before and after laser treatment is clearly visible. The right half of the deity's face has been treated with the laser.





Image of Kali before and after laser treatment | September 2013

The left half of this image of Kali with a garland of heads has undergone laser treatment, removing several layers of deep-set black tar paint. The detail of the carvings are far more legible after being treated.

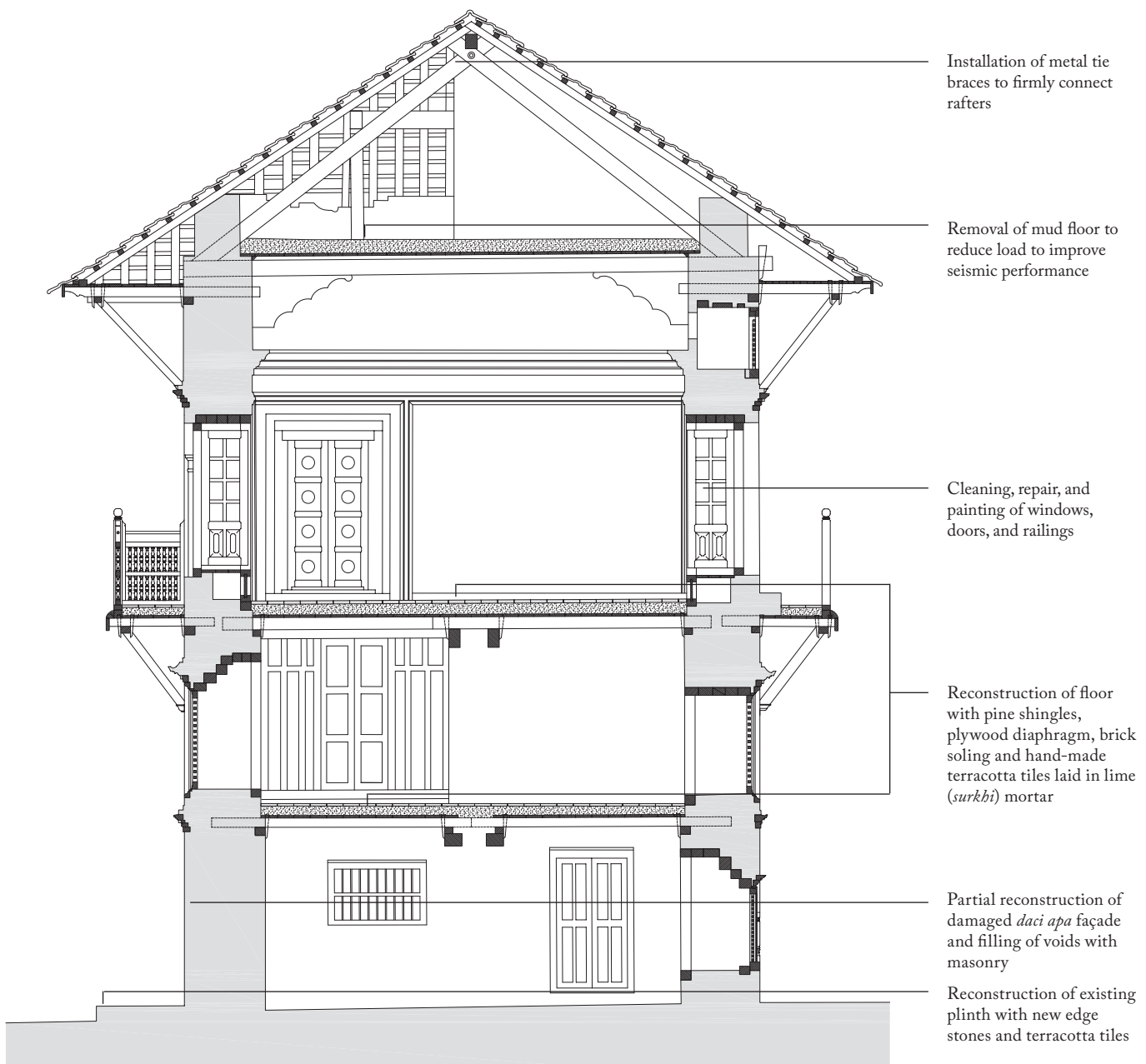




Patan Darbar Square | 2013
The north stone gate as seen from the steps of
Harishankar Temple on Patan Darbar Square.

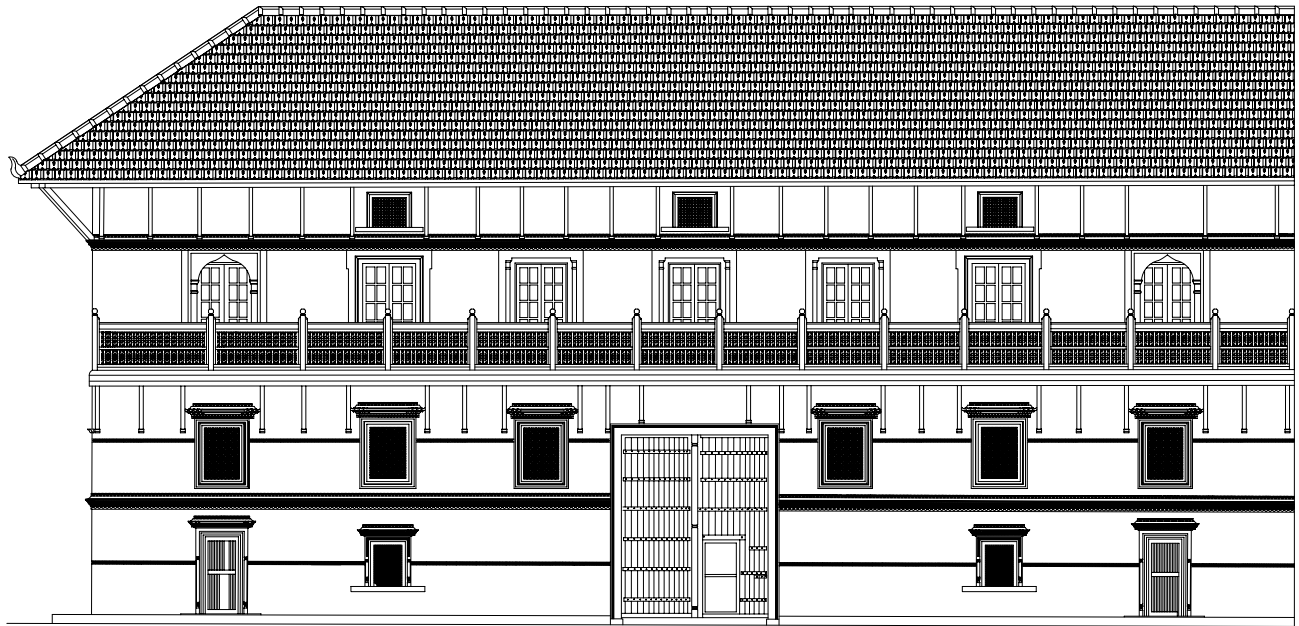






Bahadur Shah Wing | West-East Section, 2006





Bahadur Shah Wing | West Elevation, 2013



Bahadur Shah Wing | Longitudinal North-South Section, 2006





top:

Restoration of window frames | August 2013

A carpenter repairs panels for the second floor French windows with louvers.

bottom:

August 2013

Preparation of new plinth stones

A stone mason shapes and sizes a plinth stone by chiseling.





Structural reinforcement of the roof with steel collar braces | January 2014
 Steel collar tie braces were firmly attached to the rafters with 1/2" bolts. This structural reinforcement will help improve the roof's resistance to seismic motion.





Existing condition of plinth | September 2013
New edge stones were cut to match the level of the existing plinth, consisting of tiles and on-edge bricks.



Placement of edge stone | September 2013
The plinth was dismantled and the new edge stones were laid in place on top of a bed of lime and brickdust mortar (*surkhi*).



Laying tiles in *surkhi* mortar | October 2013
Lime and brickdust mortar was applied between the stones and on the surface of the plinth.



Tiles and edge stones | October 2013





Reconstruction of the floor cover on the second floor | March 2013, November 2013
Terracotta floor tiles with lime and brickdust mortar on brick soling (bottom) were placed above a layer of plywood planking (top).





Restoration of the Elephant Gate | February 2014

The central passage through the building was thoroughly cleaned, repaired, and re-coated with plaster and lime mortar. The oversized gate allowed for the passage of elephants to the stables behind the building, now the playground of the Adarsha Kanya Niketan School.





Repainting Bahadur Shah exterior | February 2014

All painted areas of the building were repainted, including second floor balcony windows (bottom). The windows were painted in their original green, a ubiquitous color in Shah and Rana period architecture of the Kathmandu Valley.





Restored room at Bahadur Shah, first floor | March 2014
View of a room on the first floor after restoration. The window openings represent a hybrid of traditional Newari scale and the European design idiom introduced by Bahadur Shah.





Restored French windows , second floor | March 2014

Bahadur Shah features French windows with glass, wooden louvers, and under-window cabinets. The windows are notable for being the first of their kind in Nepal and were to become a fashion in the 19th century.





Bahadur Shah, second floor hall | March 2014

The hall receives a warm glow of afternoon sunlight from its west-facing windows. The hall will be used for a variety of cultural activities, from conferences and lectures to film screenings and community gatherings.





Bahadur Shah from across Mangahiti | March 2014

The restored Bahadur Shah building as seen from across the Mangahiti step-well on Patan Darbar Square.



