THE 55-WINDOWED PALACE
- Conservation for the future without causing pain to the past -

The uniqueness of 55-Window palace derives out:

(a) Its 55-bayed *Viman* window and the *Chota*
(b) Its key room, the *Matan* bed room of King Bhupatindra Malla with a mural painting on one side and alcoves shaped to fit the bed side utensils of royal use.

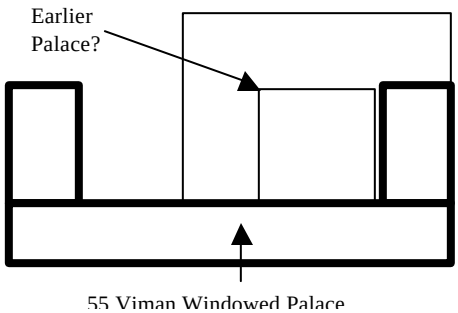
An innovative masterpiece, the palace presents the summary knowledge of the Malla period construction of a palace not only in terms of architectural design and craftsmanship but also in the structural approach. It presents a departure in the overall form of the courtyard house by taking a half court *(Khanda-chowk)* and presents its own considered structural approach to it. It also expanded the *viman* window to cover the whole external surface of the *Chota* floor wrapping it around using 55 bays, 33 on the long side and 11 each on the sides. At the same time it structurally summarized the knowledge of the *Ku-jhya*, a corner window, and streamlined and merged it with that of the structural system of the *Viman-jhya*, a projected multi-bayed vertical window.

The Palace at present is an aggregated accumulation of interventions that have not always truly complimented its original intent and purpose. As we gather here today to decide the approach towards conservation of the Palace, we should take this situational problem *as a historical opportunity* to truly and professionally respond to and respect the ideals of King Bhupatindra Malla as constrained by the 'state of the art' of his life and times. Our efforts must be to revert as close to the original as we can make out from extant evidences. Conservation must save both the spirit and the knowledge as much as we agree that the Palace is *not just* an edifice with only the inner and outer skin as having meaning as world heritage. Conservation of the Palace should, thus, objectively aim to restore the original architectural, structural and constructional glory so that in sustaining the pleasure and joy of heritage to the future, we do not inflict pains to the past. It is equally important to understand that we should use our knowledge and skills as a compliment and not a challenge to King Bhupatindra Malla and his structural engineers, architects and craftsmen. That will be the only way to safeguard and conserve both the spirit and the knowledge. Lack of consideration for original wisdom and dismissal of intents as those seen in post 1934 AD or other later interventions of recent times cannot be guiding our approach today. The current investigation shows that there was a lot of structural wisdom, in no way less than the aesthetic merit, in the building. It seems to me that periodic sensible care and renewal was all it was calling for from posterity to help it sustain the possible action of nature, whether that be a huge earthquake or a minor rainfall. Past failure to do was more responsible for the damage of 1934 and consequent results, which have brought us here together. Let us make this opportunity also a tribute to the Malla period architecture summarized by this masterpiece of a palace residential court.

Therefore the conservation strategy of this much intervened historical building will have the twin objective of restoration and preservation. The same strategic objective and standards should apply to all artistic, architectural, structural and constructional

conservation. If at all structural strengthening approach through additions is taken as 'requirement', it must be approached sensitively guided by these very objectives. The strategy would require knowing the original as truly as can be made out through an investigation of 'what was there earlier'. The documentation will have to have a significant interpretive content to aid the strategy. Conjecture should have its place through such an interpretation.

Construction/ Repair History- Tracing the Original:

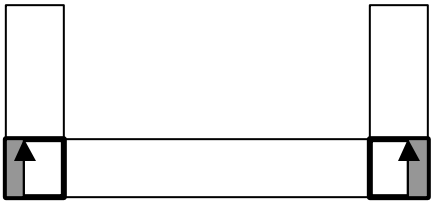


A critical study of the construction and repair history should be an important input to developing a conservation strategy for the Palace as this can clarify the architectural, structural and aesthetic nature and intent of the original builders. It is known that the construction period spanned over two decades[1] (1702-1722 AD) and Bhupatindra Malla apparently sited it over earlier structure that was a square shaped courtyard unit built by his father. The south-east corner of both the old and the new palace was apparently the same. This can be surmised from several facts: (i) The foundation remains below the floor along the N-S axial line of the building (Gutschow: 1993), (ii) the nature of the courtyard outline, (iii) the three bayed *Viman* window on the inside of the east wing and (iv) *thyasafu* records that the foundations of the new palace were laid by his father (which apparently meant use of the earlier palace foundations on the eastern half of the palace) and (v) varying foundation footing pattern observed in the building. This would mean that some incongruities in foundations and ground floor in eastern half of the palace may be said to be 'original and authentic'. Lack of foundations in 'Investigation trench # 1' explains this systemic difference at foundation level. Similarly overall asymmetrical (Ds+TW+Dc+TW from left to right in west wing) disposition of doors and windows on the outside of the west wing could be a mirror image of the original east wing. The difference in detailing at door and window lintels level and the thick wall in southeast corner, as shown by the current study, must mean that the original asymmetry of the east face and other features of this corner were changed further during later interventions. The nature of the *Viman* window in first floor of the east wing on the inside and the disposition of door and *Tiki*-windows below it should suggest that these are older than the 1702 construction. The location of *viman* window in first floor shows that the earlier courtyard unit was two storied. Therefore, only the *Chota* living room of the 55-window palace and the western wing construction were all new to start off with.

The study suggestion that the original stairway for the building was located in east and west wings along and against the outer wall is questionable for several reasons; one, (i) such a location requires use of the end door provided for communication directly to courtyard and is unguarded, (ii) two, it will require going up from north to south making the main doors on the east and the west redundant, (iii) three, the disposition of the first

[1] The long construction period is not related to this wing alone. The period was used to build many more courts in the palace and reorganize it totally.

floor joists do not support this. The disposition of joists in the first floor of the SE corner room indicate that the stair was located there. The comparative design study of the SW corner of Sundari Chowk of Patan Durbar could be illuminating to approximate the nature of this staircase. The interchange of door and window position as observed in the current study clearly reintroduces elevational symmetry about the key entry point (facing east at the corner next to Tiki-window) to the structure and reinforces the location logic. That the building was totally based on symmetry of door and window in which design replication unit was a set (TW+Dc+TW+Ds) of the original court (TW+Dc+TW+Ds+TW+Dc+TW) forming the east wing of the new palace. The axiality of the main south wing was established by centrally placing a (TW+Dm+TW) set, resulting in an eleven opening overall symmetry to the main wing. The nature of the west wing, particularly the disposition of the doors and windows on the outside in the ground floor should be expected to be related the Mulchowk on the west and those on the inside related to the courtyard frontage of the east wing. The existence of foundation for the cross wall in NW corner of the ground floor west wing could be indicating a stopped entry at ground level from Mulchowk to the palace. As the Golden gate was the king's main ceremonial entry, one would expect a mirror of the east staircase here, just as the external elevation is a mirror. The gate flanked by two *Tiki* windows led to the entry stair well. During some later renovation this staircase unit appears to have been obliterated as both the ground floor and first floor rooms changed usage. Although full room and functional plan symmetry need not be sought, the ornamental nature of the building could tend towards it. The symmetry of door and *Tiki* windows subset can only reason in the stair well position. The secure nature of the Golden Gate entrance seems to have made the bed anteroom in first floor west corner unnecessary[2].

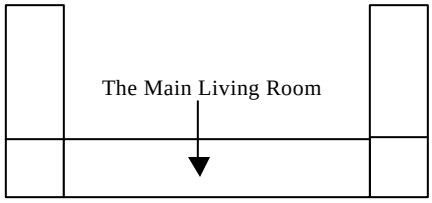


Although Mughal influences were already felt at the time (starting to show from Krishna Mandir of Patan and the Sundari Chowk of Kathmandu), when built 55-Window Palace seems to have kept clear of it. Sketches of the square from before the 1934 earthquake (Oldfield and Le Bon) prove that its outer elevation did not undergo any change up till that time. As a contrast, sometime after Oldfield[3] and before 1934, the Basantpur Durbar (to the west of the Golden Gate) had undergone stylistic changes largely influenced by Mughal style with very limited Post-Victorian Neo-classicism. Such changes should belong to late nineteenth century. Whether the change is prompted by natural disasters is not clear, but as far as the 55-Window Palace is concerned, it can be said that it was unaffected by 1833 earthquake and the causes that led to the change in Basantpur Durbar. This may be a notable matter for us that the 1833 earthquake which caused damage to Dharahara by cracking a long vertical fissure was stood up to by 55-Windowed Palace.

The nature of the 1934 damage and the massive reconstruction constrained nation of that time appears to have satisfied itself by reconstructing the *Chota* with as much salvage

[2] Sundari Chowk in Patan has its staircase located in SW corner. The SE corner ground floor room in Sundari Chowk is filled up solid to the first floor joists.

[3] Oldfield was in Kathmandu Valley between 1850-1863.



wood as possible leading to a decrease on the projection of the *viman*[4] and a reduction in the width of at least four of its bays. The reconstruction would not have logically intervened, otherwise, anywhere in the building. The reconstruction removed the two NS cross walls on the gallery floor, one of which (east) stood intact after the earthquake saving the SE section of the gallery. *It would seem that the original Chota room was in five parts, the east wing, west wing, the south wing and the corners. The corner units certainly did not form part of the south wing in this level.* This layout reconfirms that the corner room and not the side wings contained the staircase and the main living space was uninterrupted by it.

The first floor plan observation shows that the room and wall partitioning arrangement in the eastern and southern wings have remained true to the original and only the west wing has undergone changes, that were made after 1934 to suit use of the building as an extension of the Magistrate's office and/or Museum located at Basantpur Durbar. An anteroom at the south west corner was apparently not necessary due to secure nature of the stairwell there. It has already been argued why the east room and its *three-bay-viman* may be truly placed and reflects the older courtyard which 55-window palace replaced.

The most interesting room from an investigative standpoint is the corner room on the SE. The ground floor, as the study has pointed out, has been subject of two interventions, one that has added a thick masonry skin on the inside blinding two of the *Tiki* windows. The original location of the door in the opening (second from the corner to the north) has been interchanged with the *Tiki* window (third from the corner to the north). We have already seen that this room was separate from the south and east rooms in the second floor. In the first floor, this room has remained untouched by changes that were happening above and below it in so far as the wall thickness and position are concerned. Here, on the inside, is the most unusual set of post and lintel construction that makes a timber boxing as it were inside the four walls. The remains of the older joist arrangement suggest that the original floor plan here was like a modern stair well. We should take some time to analyze this peculiarity as it can potentially provide a structural restoration approach that can easily approximate and accommodate our concern of developing 'strength against another Reicheter scale 8.3 earth-shake'. By following the line of thought based on the extant element, we will also at the same time paying a tribute to its builders, who were already quite aware of the disastrous character of the "Bhukampa-dyo" and even built a temple to pacify him at Taumadhi, the site of the Tilam (Tilam > Tilamadhav > Tilam-de > Talamande > Taumadhi). A good look tells a story of its original structural marvel.

This corner square room is planned in a unique arrangement of doors and windows. If one takes the planning of the ground floor room and the first floor room together, it can be obvious that the door on the east-west divider wall in ground floor and the same door in the same wall in the first floor have undergone changes and moved from their central location to the sides. The door is correctly located in the top floor wall but the NS cross wall with a central opening has been removed. The framing and posts on the east-west

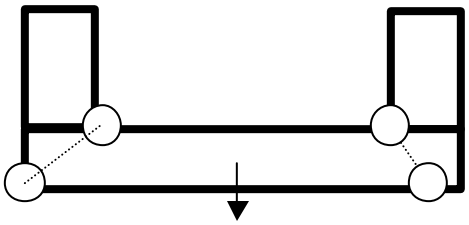
[4] Gutschow, 1993 and Maskey, 1999.

divider wall in the first floor has also been changed. The original ordered pattern for the framing can be inferred from the extant framing pattern of the first floor, its disposition of doors and the remains of the cut joists (trimmers of the stairwell) and the door and windows disposition pattern of the ground floor. The framing system is designed to stay clear of the door ways, which were positioned at the corners for entry into the building from outside and positioned centrally for entry into other rooms in the building. It is an ingenuous arrangement for four doors and two windows cramming a square corner room of about 3 meter side housing the staircase. The framing must be responding to structural demands as it has no usage or aesthetic calling. (Transparency-Drawing 1)

It can be obvious from the drawing that the stair used had a short corner landing as was usual in the construction of single flight stairways of the time. The framing pattern conveniently provided the necessary structure for such a stair system that must have gone up to the attic.

Symmetry and window and door layout suggest that this arrangement was mirrored on the SW corner. The two timber boxed cores started in the ground floor and went all the way upto the floor over the *Chota* room. It can be seen from the elevational treatment that a set of seven timber ties were used to tie the two framed cores together. In the upper *Chota* floor, the two cores were tied with the box frame forming the understructure of the *viman* window. The verandah[5] that joined the east wing with the west at the bed room level would have tied the east and west wing together. The roofing of this verandah complimented the box tie of the ornamental windowed *Chota* floor. (Drawing 2)

The 1934 earthquake caused failure to the building and the Chota floor on the main south wing gave way. The earth motion that led to the damage was north-south and the top roof fell forward to the south. The side wings and the two lower floors of the south wing survived. Apparently the verandah on the inside and its lean to roof also fell. The nature of the failure can tell that the floor ties did not give way saving the floor over the bedroom intact. This should mean that the tie system at the base of the *viman* window also did not fail. It should be a matter to note that the failure occurred on that part of the building which was basically a timber framed floor weighted with a heavy roof. Stresses would be more in upper floor, but with the nature of construction, this floor should also have behaved stronger. The structural engineering at the time of construction of the palace was already armed with the jointing innovations for floors[6] and corner *viman* windows and frame action obtained through the system of constructing the long multi-bayed *viman* window spanning from corner core to corner core. The reason for the failure therefore should be sought at the roof joints. The diagram shows these critical areas, where the joints must



[5] Although verandah in that level for three storied palace is rare, this verandah must have been there in the original composition as the doors exiting to it from the main room of the king would suggest. It was apparently brought downwards for constructional expediency during 1934 repairs.

[6] The technique was developed extensively during the construction of Nyatapola. The top tier of Nyatapola also failed in 1934 primarily due to its lightness.

have been considerably weak at the time of the earthquake. These joints were strong enough in the past, but 220 years and a major earthquake was too much. Action of age and water on the joints may explain the damage better than the earthquake action per se.

The eleven opening format of the south wing and the extant wall arrangements inside point out towards other changes that have been made to the partitions in ground floor of the building. The cross wall, essentially partitions, should be expected and typological comparison with other structures would require the original set formed by 2+2+3+2+2 in an eleven opening composition. Thus the two cross walls mirroring the east side are missing on the western part of the south wing.

The above discussion, not only establishes the original aesthetic, structural and constructional system and intent, but should also provide us with ways of approaching the conservation. At a time, when the two other palaces have been 'conserved' with modern technological intervention (and one of them even grafted with 'post-modernist *design'*), I recommend that we use a method that sensitively 'rediscovers and reinforces' the tradition, materially, architecturally and structurally. That should so even if we find our fore fathers a little less knowledgeable than us. This way source for the knowledge required for the current conservation can be the building itself.

Two particular concerns associated with the problem of conservation of the 55 Window palace will be taken as a point of departure for conservation strategy now. They are:

(i) The 'weakness' of the structure against Earthquake and the much touted need for 'strengthening'
(ii) The wall tilt observed in the building and the special demand of the painted wall in the central bedroom of King Bhupatindra Malla

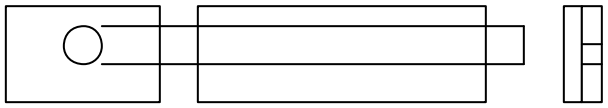
The first concern however is not so convincing to this author. Particularly as it can be seen from the partially conjectured over view that the designers, that were, seem to have taken measures that had made it strong enough to meet the 1833 earthquake that rocked it after more than a century and a quarter after its construction. It was not a weak structure when it was constructed. A hundred year of neglect and the 1934 quake brought its *Chota* down. Even then the South-East and the South West corner *Chota* did resist it. The palace was still defiantly strong. Today, the restorations following the 1934 quake and the more recent changes that have eaten its structural strength, are clearer to the expert eye and that should telling on more on how we could weaken structure. Introduction of new strengthening system would call for a whole new backbone structure in parallel to its own and would not be desirable. Instead looking for means of adding to the original concept will be a much better option. If we introduce floor cross ties where ever possible as given by the cross wall layout (at *Cheindi* roof and *Chota* floor as shown with green dots in drawing 3) and introducing vertical link ties in places inside the *Dachiapa* veneer on the outer walls could add to the strength considerably. Therefore I recommend the strengthening method as per drawing 3 using properly jointed and seasoned timber be used. This would require reconstruction of the veneer wall in several places. It would also require total reconstruction of floor ties, verandah and stair cores.

The leaning walls are facts and the problem is real calling for ‘emergency interventions’ approach. But since the 'emergency' has extended for so long, starting the works that form a part of the full scheme but which help stop further aggravation of leaning tendency should qualify as emergency intervention. The recommended approach is to *house in* the vertical timber ties (wall stiffeners by removing the brick veneer and decorative door and window heads) and introducing similar uprights on the outside at the back pressing against the wall on the verandah. Wall plates will be used behind the cornice ties all along the length of the wall and pressed in by the uprights. These wall plates will be tied to the outermost structural frames of the door and windows. Alternatively hidden internal posts may be introduced linking the window and door system to the plates. A temporary timber boxing is constructed inside the room with wall plates to avoid movement of walls during the tightening process[7]. The vertical posts are tightened with horizontal timber tie spanning the width of the building and placed underneath the *Mata* floor and over the *Chota* floor. The objective is not to straighten the tilt but to stop further tilt through unitary action. It may require some way of counter balancing at the vase of the verandah floor and the upper *chota* level.

Except the internal boxing all the emergency works will be retained in the structural conservation action, which would be mainly reconstructing the inner timber core frames in the corner stair wells. The staircases will be repositioned. The *Chota viman boxing system* will be integrated with the core structure. During this process the jointing and sways of structural posts and lintels would be done. I do not recommend that we try reverting back the window to original by increasing the projection as this may add to counter balancing needs and overstress the leaning out wall.

All the missing cross walls with some incorporating a timber floor or ceiling tie will be reconstructed. Changed door positions are then relocated. The restoration of tempera wall murals would be taken as and when all other works are complete.

The above approach will conserve and preserve the palace in the best possible way that local technology, material, skill and knowledge can achieve. It will be a tribute to the key building product of a culture that is deservedly a world heritage.



[7] As only wedges are known used in making tight joints, the nature of stresses may require stopping the timber ends with metal plates with bolted ends to allow for gradual tightening without causing vibration to the wall with precious murals and décor.