2012

17 BU-HALIMA'S TOMB - GARDEN
Garden Restoration

Bu Halima's tomb garden, also dating from the 16th century, stands abutting Isa Khan's Tomb at the entrance zone of the Humayun's Tomb complex. In the 1920's portions of the enclosure wall were demolished to make a circular roadway thus destroying the character of the enclosure as well as disfiguring the historic character of the site with vast quantities of cement concrete.

ACTION TAKEN:

• Clearance of earth revealed the foundations of the demolished portions of walls to be merely 10-15 cm below existing ground levels.

• Random rubble masonry wall was built on the original foundations matching the height of the standing portions of the enclosure wall.

• A bastion built in the 1920's when the wall was demolished was retained as part of the enclosure.

• Though photographic evidence of an arched gateway in the western stretch existed, the ASI Core Committee was of the opinion that this arched opening not be reconstructed.

• The 10 m wide cement concrete roadway has been dismantled and a central pathway matching the width of the pathway leading from Bu Halima Gateway to West gateway of Humayun's Tomb has been built in sandstone.

• This central pathway allows a gradual slope thus removing the steps and ensuring easy access for those using wheelchairs.

• The new levels have also ensured that 40 cm of Bu Halima gateway buried below concrete is once again revealed to its original character.

• In order to minimise removal of earth from within the enclosure, secondary pathways aligned almost along the British era retaining walls have been built and also serve as a retaining wall, both on the northern and southern sides.

NEXT STAGE:

• The grading and pathway works will be completed in early 2013.

• In spring 2013 a citrus orchard will be planted in this garden enclosure.

• Plinth protection along the enclosure walls is planned.

Bu-Halima Tomb - Garden ▲
Early 20th century British-era carriageway disfigured the historic character of Bu Halima's Tomb - Garden and the entrance zone of the World Heritage Site. Works underway on the landscape and restoration of the enclosure wall

2013

09 BU-HALIMA GARDEN-TOMB

Aligned in axis with the western gateway of Humayun's Tomb Garden enclosure and standing adjacent to the northern gateway of the Arab Sarai, the monumental gateway to the Bu Halima Garden enclosure required major conservation works aimed at restoring the historic architectural character and the original design intention of the Mughal builders.

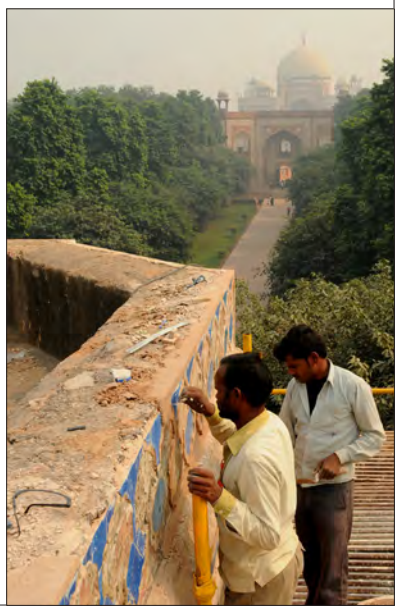
Restoring Glazed Tilework

Some portions of the exquisite glazed tile work on the Bu-Halima Gateway were still present on the eastern façade in the form of tiled medallions in the spandrels of the large recessed arch, tile inlay work in the panels of chamfered surfaces and in kangura patterns on the parapet.

ACTION TAKEN:

- The extensive documentation of the tile remains, of the large medallions comprising of small pieces of tiles beautifully put together, were carried out and the shapes and sizes of missing tiles were recorded.
- For missing tiles, new tiles matching the original were then prepared.
- All original tiles were retained, even where these had lost their glaze in continuation of the philosophy agreed upon for the Humayun's Tomb conservation.

(Above) View of Bu Halima Gateway in 2012 prior to conservation works
(Below) Restoration of the exquisite tilework on the medallion, parapet and spandrel of Bu Halima's Gateway



Restoring Lime Plasterwork

The rubble masonry gateway, finished in plaster, is a simple structure when compared to the gateway's it stands amidst. The eastern facade is chamfered at the corners and the centre portion treated with a large arched recess which encloses a slender arched opening in the centre of the facade, with jharokhas and an arched opening of similar size repeated on the upper level.

ACTION TAKEN:

- This monumental gateway first required the cement and other modern plastered portions, on the façade, to be removed.
- The western, southern and northern sides have wider arched openings repeated on both levels in the centre of the façade.
- The plaster on the lower half of the façade was mostly lost and has been re-plastered on at least two occasions since 2001, and plasters using inappropriate modern mixes were used on both occasions thus accelerating the decay process for the lime plaster that remained.
- The new plaster was also found to be peeling off with deterioration caused due to a variety of reasons such as dampness, inappropriate mix, preparation and bonding between adjacent layers.
- After allowing the masonry to dry out the portions where modern plaster layers were removed, the surface was re-plastered in lime mortar.
- The roof has a raised platform over the central dome and the remaining portions have, like most other buildings in the complex, been laid with additional layer/s of concrete. The parapet ornamented with the Kangura motif, which had has collapsed in portions and poorly rebuilt, are now reconstructed and tiles are laid where they were missing.

NEXT STAGE:

Interior portions of the gateway require removal of cement plasters and repairs using lime mortar. Re-levelling the floor level to be completed. Works are proposed to commence with the removal of additional concrete layers from the roof and the repair of the parapet in portions where this has been altered in order to match the original sections. This will ensure appropriate water disposal from the roof.

(Above) On the basis of a careful study, the additional concrete layers has been removed, addressing the serious issues of deteriorations. Master craftsmen used traditional materials, tools and building techniques to undertake conservation works and carefully removing all the cement and other modern plastered portions, on the façade and the interior spaces.

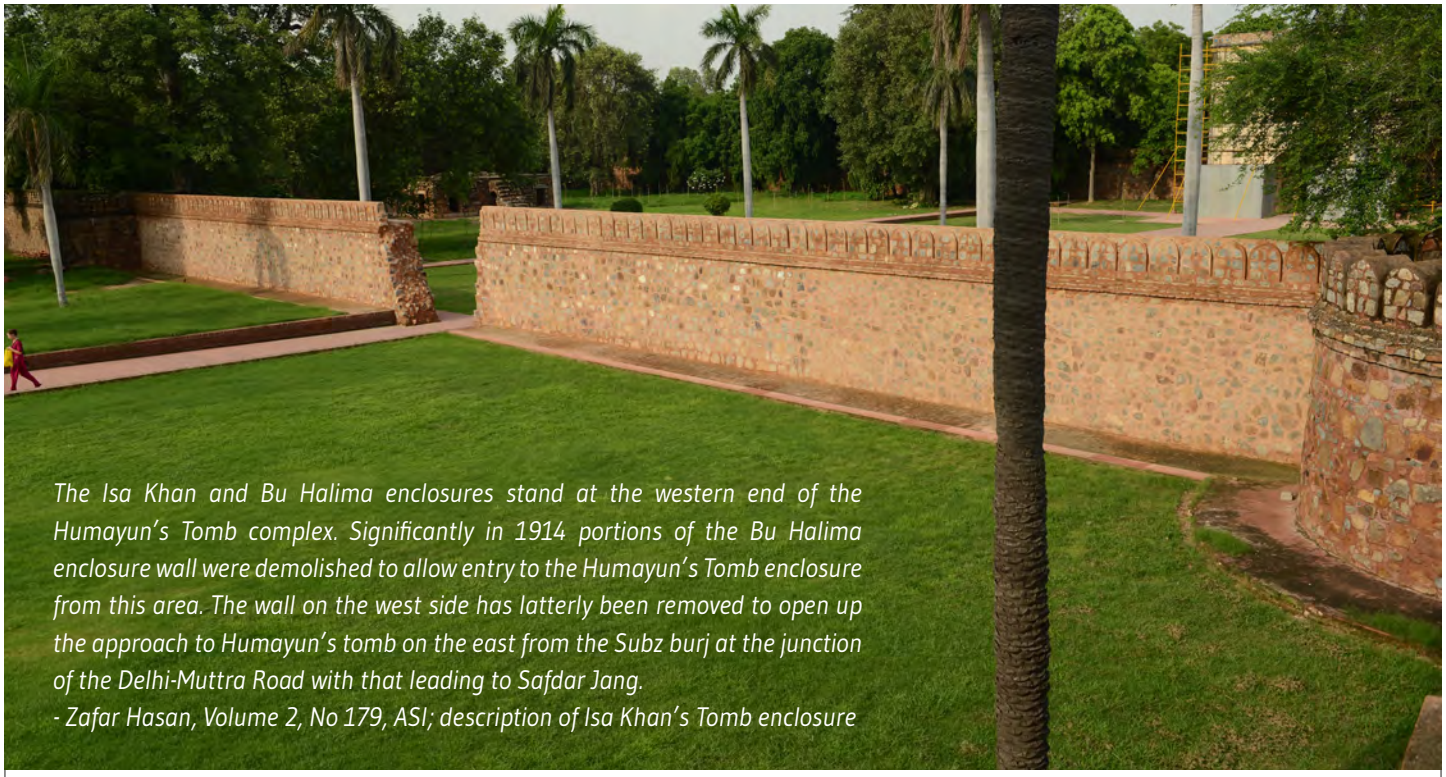
Installing Sandstone Lattice Screens

As is visible in archival images, sandstone lattice screens were originally used on the gateway in the arched niches over the doorways and parapets. These screens seem to have been replaced with cement screens (as shown in the image above) on some of the openings and altogether removed from the parapets on the northern and southern sides. The conservation effort aimed at removing cement screens and restoring hand chiselled sandstone screens.

ACTION TAKEN:

- The careful documentation of all the openings was carried out to determine accurate sizes of all screens required.
- Seventeen lattice screens hand crafted by the master craftsmen are being prepared and seven have already been installed in the arched openings on the lower floor.

(Above) View of the Gateway before commencement of conservation works; (Below: Left to Right) Removal of cement jaali/lattice screen and installation of sandstone jaali's by the craftsmen



The Isa Khan and Bu Halima enclosures stand at the western end of the Humayun's Tomb complex. Significantly in 1914 portions of the Bu Halima enclosure wall were demolished to allow entry to the Humayun's Tomb enclosure from this area. The wall on the west side has latterly been removed to open up the approach to Humayun's tomb on the east from the Subz burj at the junction of the Delhi-Muttra Road with that leading to Safdar Jang.
- Zafar Hasan, Volume 2, No 179, ASI; description of Isa Khan's Tomb enclosure

10 Garden Restoration

As with Emperor Humayun's Tomb, Bu Halima's Tomb also stands within a walled garden. Almost half of the western side of the enclosure walls (comprising almost 15% of the total length of walls) were however demolished in the early 20th century to make a road. Garden levels have since also been considerably altered leading to the gateway flooring being almost 50 cm lower than the garden on its west leading to immense water-logging, besides altering original relationship.

ACTION TAKEN:

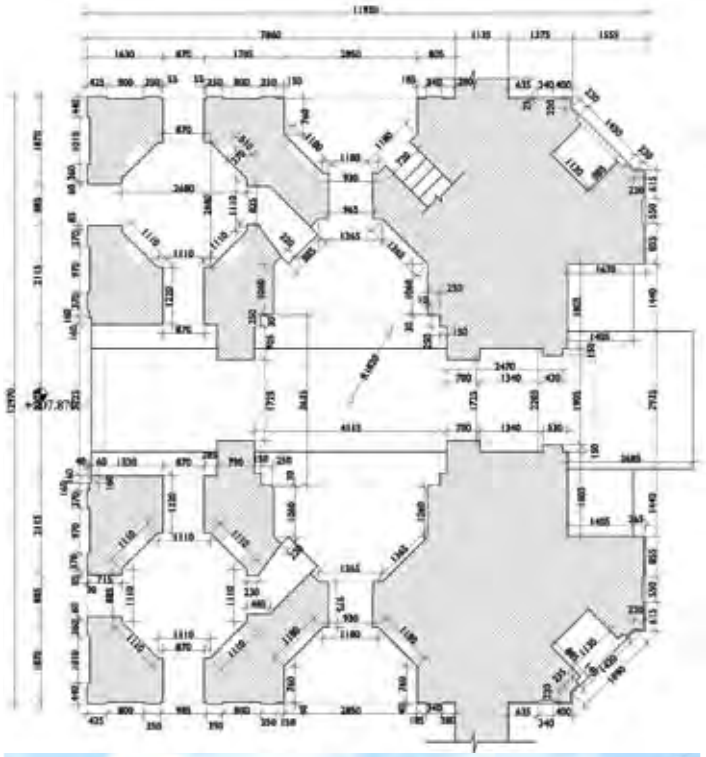
- As part of the landscaping works, the levels of the area on the west of the gateway were lowered to ensure the historically appropriate relationship between the gateway and its settings restored. Retaining walls in brick masonry were erected on the either side to minimise earth removal in view of large trees.
- Planting layout was carried out in the Bu-Halima's Garden Tomb, after the complete reconstruction of the missing wall in 2012. Orchards of peach trees are now grown in the complex.
- Sandstone pathways have been laid in the garden and as plinth protection along the entire internal length of the enclosure wall.

(Above) Early 20th century British-era carriageway which disfigured the historic character of Bu Halima's Tomb - Garden and the entrance zone of the World Heritage Site has been demolished and original landscape restored

2014

06 Bu-Halima Gateway

Aligned in axis with the western gateway of Humayun's Tomb Garden enclosure and standing adjacent to the northern gateway of the Arab Serai, the gateway to the Bu Halima Garden enclosure stands on the Western side of the tomb-garden enclosure.



On the eastern façade, upper arched opening has sandstone *jharokhas* with beautiful lattice parapet which is supported on decorative sandstone brackets. Remains of the original tile work decoration existed on the parapet. On the lower level, alterations to the plinth had been carried out in the past to enable the use of the space as a ticket counter. Conservation works are now been undertaken addressing the serious issues of deteriorations by carefully removing all the cement and other modern plastered portions on the façade and the interior spaces. All the cement lattice screens that were fixed to the arched openings have been replaced with hand chiselled sandstone lattice screens.

Bu Halima Gateway (Left) Before conservation in 2011; and (Right) After conservation in 2014

Glazed Tileworks

Action Taken:

· Portions of exquisite glazed tile work on the Bu-Halima Gateway *(Above)* were still present on the eastern façade in the form of tiled medallions in the spandrels of the central large recessed arch, tile inlay work in the panels of chamfered surfaces and on the parapet.

· The extensive documentation of the tile remains, of the large medallions comprising of small pieces of tiles beautifully put together, were carried out and the shapes and sizes of missing tiles were comprehended.

· The tiles were then prepared using the original materials and techniques.

· The tiles were then arranged in the original position by the craftsmen and now tile restoration work is completed on the Bu-Halima Gateway.

· The spandrels of all the arches and parapet were then finished with the Red polychromy work.

(Above) Tilework and polychromy works at Bu Halima's Gateway suffered deterioration; (Left) Following detailed architectural documentation and condition assesment, tilework, where missing was restored (Below)

Lime Plasterwork

Action Taken:

• The rubble masonry gateway, finished in plaster, is a simple structure when compared to the gateways it stands amidst. The eastern facade is chamfered at the corners and the centre portion treated with a large arched recess which encloses a slender arched opening in the centre of the facade with *jharokhas* and an arched opening of similar size repeated on the lower level. The western, southern and northern sides have wider arched openings repeated on both levels in the centre of the façade.

· The plaster on the lower half of the façade was mostly lost and has been re-plastered in cement on at least two occasions since 2001. This inappropriate conservation work on the monumental gateway first required the cement and other modern plastered portions on the façade and the interior spaces to be carefully removed.

· After completely removing the added cement layers, the plastering works were commenced. The plastering layers included coarse lime mortar for the base layer and fine lime mortar for the top layer. The plastering works were then finished using a coat of 1 mm fine layer of Lime punning comprising of 1:1 ratio of lime and marble dust.

· The parapet ornamented with the *kangura* motif, which had collapsed in portions and poorly rebuilt, are now reconstructed and tiles are laid where they were missing.

· The Lime plastering work is complete on the external and internal surfaces.

· The internal chambers had ornamental plasterwork on the ceilings and medallions, though much of it is lost due to neglect over the years.

· These decorated surfaces were repaired in plain cement plaster which leads to the loss of most of the decorated plasterworks.

· After careful documentation of the existing remains, the original patterns were discerned and the restoration works were carried out by the master craftsmen by replicating the existing patterns.

· These decorative patterns are then finished with Lime punning and application of red polychromy.

(Above) The Gateway walls had been covered with cement plaster which was required to be removed; (Right) Restoration of historic lime plaster on the walls and arches

Sandstone Lattice Screens

Action Taken:

· After the inspection of the building it was found that in the earlier conservation attempt the sandstone screens have been replaced with cement screens. Such interventions have severely disfigured the historical significance of the structure.

· The careful documentation of all the opening sizes and shapes was carried out and the lattice screens were then hand crafted by the master craftsmen.

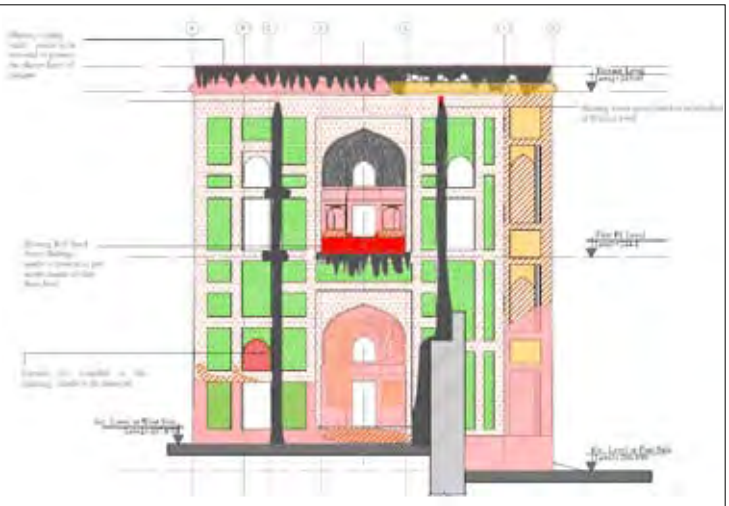
· All the lattice screens are now prepared and installed in the arched openings of the structure.

· After the inspection of the building it was found that most of the beautifully carved sandstone lattice screen parapets were missing from the structure which severely disfigured the historical significance of the structure and made it unsafe.

· The existing parapet screens were studied for details like sizes and shapes of the parapet. The screens were then hand crafted by the master craftsmen.

· All the parapet lattice screens are now prepared and installed in the arched openings of the structure.

(Above) Sandstone jaalis which were replaced with concrete jaalis (Bottom Left), were re-installed after a detailed documentation. Bu Halima's gateway after restoration of sandstone jaalis (Bottom Right).



Sandstone Flooring

Action Taken:

· On the lower level, alterations to the plinth had been carried out in the past to prevent water ingress once earth levels on the west, north and south of the gateway had increased significantly due to earth in-fill. The inappropriately built internal platforms were broken to understand the original levels; and it was found that the original floor level is about 50cm lower than the existing level.

· The levels of the internal platforms were then restored by lowering the platform and it was finished by providing sandstone paving on these platforms.

· This allowed the central portion to be widened by about 60 cm on either side thereby significantly enhancing the historical character of the space.

Lime Concrete Terracing

Action Taken:

· After completely removing the added cement layers from the terrace, the terracing work started using the lime concrete comprising lime mortar and brick aggregate. Traditional organic additives such as Bael Fruit pulp, jaggery were added to make the surface water tight and as per original slopes and details.

· The terracing works are now complete.

(Above) A detailed condition assesment of the structure was carried out as a precursor to conservation works and included listing all works required to be carried out; (Below) Cement concrete from the roof was manually removed and replaced with a traditional lime concrete based flooring. This required over 100 cu. ft. of lime concrete to be lifted to the roof.

(Above) Removal of dead cement pointing and stitching the cracks in the enclosure wall and bastion chambers was followed by pointing with lime mortar.

07 Bu-Halima Complex: Enclosure Wall

Removal of Cement Pointing

Action Taken:

· The Outstanding Universal Value of the Humayun's Tomb World Heritage Site is recognized as this being the densest ensemble of the Mughal era Garden-Tombs. Each of the tomb complexes was enclosed in masonry enclosure walls and therefore the enclosure wall is as significant as the monuments sitting within these complexes.

· The joints of the masonry enclosure wall were finished in cement which lead to the deterioration of the original historic fabric.

· The cement joints are raked from the enclosure wall and after the completion of raking of joints, the wall surfaces were rubbed to ensure the complete removal of salts from the wall surfaces.

Re-Pointing using Lime Mortar

Action Taken:

· After raking out the cement from the joints in the enclosure wall, they were then re-pointed in lime. The wall surfaces were cured with clean water after the re-pointing works dried.

· The plinth protection of the enclosure wall was finished in cement as a previous intervention.

· The cement concrete was removed from the plinth protection of enclosure wall and the conservation works were finished with the restoration of the sandstone plinth protection along the entire length of the enclosure wall.

· The works on the enclosure wall are now complete.

Stitching of Cracks

Action Taken:

· The enclosure wall and the chambers in the Bastion suffered from deep structural cracks due to neglect over the years.

· The cracks are repaired with the help of grouting

· It was also found that the arched entrances in the Bastion chambers were in an advances state of disrepair. These arches were repaired with the help of brick shuttering which was made as per the original sizes.

· The walls and ceilings of the Bastion chamber are then finished with the application of base and fine layer of lime.