Delhi
The Area of Humayun’s Tomb

Humayun’s Tomb World Heritage Site comprises several 16th-century garden-tombs.
Delhi has been in continuous existence for over a thousand years. At least ten capital cities were built here, all within a triangle formed by the River Yamuna on the east and the hilly outcrop of the Delhi ridge on the west and south.

In the early thirteenth century Ghiyasuddin Balban, prior to becoming sultan of the Slave dynasty or the Il Bari Turks, built a palace called Lal Mahal along the River Yamuna, and the area came to be known as Ghiyaspur. A few decades later Hazrat Nizamuddin Auliya, a revered Sufi saint, chose to meditate and live in close proximity to the palace. In 1325 he was buried nearby in the courtyard of a mosque built in his honour during the rule of the Khalji dynasty, and the area came to be known as Nizamuddin.

Two centuries later, in 1526, after winning his battle for control of Hindustan at Panipat, Emperor Babur recorded his entry to Delhi in his journal: “On Tuesday, I circumambulated Shaykh Nizam Awliya’s tomb and camped beside the Jamuna directly opposite Delhi. That evening I toured the Delhi fortress…” That Babur, the founder of the Mughal dynasty, would offer his reverence at the saint’s grave on his entry to Delhi and prior to even visiting the fortress he had just conquered demonstrates the spiritual significance of the area to the Mughals.

As it is considered auspicious to be buried near a saint’s grave, an abundance of tomb building occurred in the area beginning in the fourteenth century. Many of the most significant structures of the early Mughal reign were also built here, beginning with Emperor Humayun’s capital city of Dinpanah – its citadel today known as the Old Fort.

Just south of the city of Dinpanah, along the banks of the River Yamuna – abutting Hazrat Nizamuddin’s riverside chillgah, or meditation chamber, and on the Grand Trunk Road that linked Lahore to Calcutta – Emperor Akbar built the Tomb-Garden of his father Emperor Humayun in the mid 1560s. As Ebba Koch,
a noted historian of the Mughal Empire, writes: “With the first major building enterprise of Akbar’s period, the tomb of his father [...] Mughal architecture came into its own. The tomb of Humayun is a synthesis of creatively developed Timurid ideas and local traditions, the whole breathing true Mughal splendour in its perfect planning. It is the first of the great dynastic mausoleums that were to become synonyms of Mughal architecture. Here for the first time the monumental scale is attained that was to be characteristic of imperial projects.”

In 1993 Humayun’s Tomb complex was inscribed on the UNESCO World Heritage list. UNESCO documents state that the Tomb complex was “built on a monumental scale, with a grandeur of design and a garden setting with no mausoleum precedents in the Islamic world. [It] truly represents a Mughal innovation [...] Humayun’s Garden-Tomb, and several contemporary sixteenth structures on the property, form a unique ensemble of Mughal-era garden-tombs.”

The urban renewal project led by the Aga Khan Trust for Culture (AKTC) focuses on an area that is home to structures built over a period of seven centuries, including the three centuries of Mughal rule. The project has aimed to undertake conservation works on all the monuments standing within the project area, using traditional materials, tools and building crafts. Conservation works were coupled with the landscaping of almost eighty-one hectares to restore the setting of the monuments and the buffer zone of the World Heritage Site, as well as to ensure long-term preservation.

The project has revived a craft-based approach to conservation. Stone-carvers, masons, glazed-tile makers, carpenters and plasterers have worked alongside multidisciplinary teams of conservation and landscape architects, civil and hydraulic engineers, archaeologists, architects, historians and designers to develop a model conservation process for the Indian context.
Establishing the Project

Background

When designating Humayun’s Tomb as a World Heritage Site in 1993, ICOMOS experts were “critical of the poor state of the gardens around the tomb” and the Archaeological Survey of India (ASI) undertook to restore the gardens as a precursor to the UNESCO designation. The year 1997 marked fifty years of India’s independence and on that occasion His Highness the Aga Khan, in response to a request from ASI, gifted the garden restoration of Humayun’s Tomb to the nation. This was the first scientific garden restoration in India, as well as the first privately funded and implemented conservation effort at any of India’s monuments of national significance.

The gardens within the 10.5-hectare walled enclosure of Humayun’s Tomb were in a decrepit state and suffering from insensitive alterations and planting. The neglect of almost a century had disfigured the historic character of the site. The work on the garden thus aimed at restoring its original levels, planting flora appropriate to Mughal gardens and restoring flowing water within the garden. This effort required that 12,000 cubic metres of earth be manually lifted and removed to restore levels; three kilometres of sandstone were hand-chiselled to replace the missing or damaged sandstone edging of the water channels; over 3000 plants were added; the restoration of 22,500 square metres of pathways was carried out; and a major rainwater harvesting system was introduced, all part of the works carried out by AKTC. The garden restoration was completed in April 2003 and AKTC managed and maintained the restored gardens for an additional year.

Following the success and significant impact of the restoration of Humayun’s Tomb-Garden, the then prime minister of India, Dr Manmohan Singh, requested a further partnership in the field of culture. In response to this request, and also in order to build on the success of the garden restoration and to demonstrate the potential of coupling conservation efforts with socio-economic development and environmental development initiatives, AKTC expressed a desire to return to the Humayun’s

[5] Restoring the central incised plaster medallion on the ceiling of Humayun’s Tomb entrance chamber.
[6] Young people from the adjoining Hazrat Nizamuddin Basti were employed to make the ceramic tiles, thus reviving a craft tradition.
[7] Restoration of tile work on the canopies on the roof of Humayun’s Tomb as per original patterns.
Tomb – Nizamuddin area to implement an Urban Renewal Initiative that would showcase Mughal heritage while improving the quality of life for local communities and significantly enhancing the visitor experience.

Partnerships
To fulfil the project objectives of heritage and environmental conservation and socio-economic development, a single ‘Memorandum of Understanding’ (MoU) was signed on July 11, 2007 with ASI (the government of India agency mandated for the preservation of national heritage); the Central Public Works Department (owners of the twenty-eight-hectare Sunder Nursery); as well as the Municipal Corporation of Delhi (responsible for primary health, primary education, sanitation, urban improvements and waste management).

Just as the garden restoration of Humayun’s Tomb-Garden was the first such initiative, there was no precedent in India for a private agency undertaking an urban renewal project with diverse components. AKTC was responsible for coordination between government agencies. This has remained a significant challenge especially since follow-up MoUs have been signed with several other agencies, such as the Delhi Development Authority, Delhi Government’s Department of Women and Child Development, the Public Works Department and the Department of Archaeology, among others.

The Nizamuddin Urban Renewal Initiative has included at least two hundred individual projects over the past seven years that include conservation works on almost fifty individual monuments and landscaping of over eighty-one hectares spread across the Humayun’s Tomb complex, Sunder Nursery and the neighbourhood parks in Hazrat Nizamuddin Basti. A major community health programme coupled with pathological facilities for over 55,000 people has also been part of the initiative, as have education programmes ranging from primary education to adult education and vocational training, livelihood training, the construction of community toilets, reviving the cultural legacy of the area represented by seven centuries of musical traditions, and other intangible heritage efforts that include food, crafts and rituals.

Critical funding required for project activities has been received from a multitude of agencies, thus allowing expansion of the programme. Conservation works at Humayun’s Tomb and Nila Gumbad have been co-funded by the Sir Dorabji Tata Trust and allied trusts. Isa Khan’s garden-tomb and Bu Halima’s garden-tomb have been conserved subsequent to grants from the World Monuments Fund. The US Ambassadors Fund for Cultural Preservation provided funds for the conservation of the sizeable Batashewala-Unknown tomb complex as well as for Sunderwala Burj: a tomb in the complex is known as the “Unknown tomb”. The German Embassy supported the complicated conservation works undertaken on Chausath Khamba and the Arab ki Serai’s northern gateway while the JM Kaplan Fund and Housing and Urban Development Corporation helped work on the Sunderwala Mahal. The Department of Archaeology of the Government of Delhi and the Delhi Development Authority have recently allotted funds for the conservation of Azimganj Serai and monuments in Hazrat Nizamuddin Basti respectively. With Interglobe Foundation pledging funding, conservation works are also to commence on the grand mausoleum of Abdul Rahim Khan-i-Khana, the famous poet and general in Emperor Akbar’s army. Planning is now underway to build a modern site Interpretation Centre with funding from the Indian Ministry of Tourism.
DELHI THE AREA OF HUMAYUN’S TOMB

1 Azimganj Serai
2 Sunder Nursery
3 Batashewala Complex
4 Humayun’s Tomb Site Museum
5 Humayun’s Tomb Complex
6 Hazrat Nizamuddin Basti
7 Abdul Rahim Khan-i-Khana’s Tomb
8 Nila Gumbad
State of Conservation

Though designated a World Heritage Site, Emperor Humayun’s Tomb and its attached structures were in a poor state of preservation with inappropriate past repairs that severely compromised the authenticity of material and design and accelerated the process of decay. Major works undertaken on several structures in the complex as recently as 2003–05 included laying cement layers on roofs and plinths and the profuse application of cement plaster on wall surfaces – often obliterating ornamental incised plasterwork. Since 2007 much effort has gone into undoing past repairs, using traditional materials and building craft techniques to restore architectural details formed by the Mughal builders, where these are known.

Despite the rapid and almost uncontrolled urban development that Delhi has witnessed over recent decades, the link between Humayun’s Tomb and Humayun’s Old Fort citadel had remained green – with Sunder Nursery and the National Zoological Park occupying a large part of this space. A threat to the integrity of the site came from a proposal of the Delhi government to build an extension of National Highway 24 through Sunder Nursery in order to connect central Delhi with eastern parts of the city. Not only would this have split the setting of the World Heritage Site and made future planned extensions impossible, but an expected 12,000 cars per hour would have been brought to the entrance of the Humayun’s Tomb complex, making access for visitors unpleasant. A cross section of civil society groups, including environmentalists and resident welfare associations, led a campaign against the planned route that was eventually not permitted to be built by the Delhi Urban Art Commission.

The immediate setting of all major monuments within the project area had been disfigured. Bu Halima’s garden-tomb enclosure was breached by a twentieth-century carriageway. Earth levels within Isa Khan’s garden-tomb were over one metre higher than original levels. Sunderwala Burj stood within a traffic island; Sunderwala Mahal was hemmed in by temporary structures built for nursery operations; the Batashewala complex and the Unknown Mughal tomb lost much of their walled enclosures; and the Nila Gumbad was separated from Humayun’s Tomb by a road and hemmed in by squatters.

Conservation works undertaken by AKTC have included restoration of the immediate landscape setting and enhancing the landscape of the wider setting. Lack of available archival material and historical research meant that the project required a significant research effort at institutions across the world to source archival photographs and records of works carried out during the British era. On-site investigations – archaeology,
architectural documentation, a ground-penetrating radar survey and 3D high-definition surveys using laser scanning – were used in addition to archival research to fully understand the site prior to the formulation of the Conservation Plan.

Just as the state of conservation and the setting of the monuments had to be addressed, so, too, did the disconnection of the monuments with the residential communities of Hazrat Nizamuddin Basti, where, despite the presence of a dense ensemble of medieval monuments, the quality of life was poor. High malnutrition among children, poor health parameters especially for women, lack of basic in-home toilets, poor waste disposal, high levels of illiteracy and dropouts among school children, high unemployment with less than one per cent of women employed were some of the factors that had to be addressed as part of the urban renewal initiative.

A significant cultural revival programme led by youths from resident communities, who were first involved in a cultural mapping exercise, has led to resurgent pride in parts of the population. Each year, local youths have walked thousands of school students through the narrow lanes, bringing alive the built and intangible heritage, and in turn helping to bridge a communal divide. Local youths have also been at the centre of a craft revival and have been trained by craftsmen from Uzbekistan to make glazed tiles matching those of the Mughals.

Conserving Mughal Heritage

Following the thirteenth-century construction of Lal Mahal, the earliest structures in the greater Nizamuddin area were mainly built in what today constitutes the Basti – where the saint Hazrat Nizamuddin Auliya lived and was buried. The early fourteenth-century mosque and the step-well, or baoli, built here indicate the presence of a large congregation of followers of the saint.

With the arrival of the Mughals, considerable building activity commenced here in the early sixteenth century and continued until the decline of the Mughals in the nineteenth century, making the Nizamuddin area easily the most significant building site of the early Mughal reign. Though over two dozen monumental structures stand within the project area, with the most prominent among these being the tomb of Emperor Humayun and the attached Nila Gumbad, the other Mughal structures can be classified in three distinct categories: the tombs of prominent nobles; garden-tombs adjoining Emperor Humayun’s mausoleum; and finally the Mughal serais.

Humayun’s Tomb

Historical background

It is striking that the Tomb-Garden of Emperor Humayun has no precedent in the Islamic world in terms of scale, design and use of material. At the time, it was easily the largest mausoleum to have been built – dwarfing the tombs built in Delhi during the preceding Sultanate era. The construction of the mausoleum was commenced a decade after Emperor Humayun’s death and only once his son and successor Emperor Akbar had consolidated the throne. As such it was as much a political statement of the young Akbar, as it was a memorial to his father’s memory.

The mausoleum sits in an enclosed garden, based on the Qur’anic description of Paradise and in keeping with the Mughal
The development of tombs – in typology, scale and geometry – in Delhi. Humayun’s Tomb (far right) was built on a much larger scale than any of the tombs built in the city since the 12th century.

Section and elevation of Humayun’s Tomb. The central tomb chamber is over 24 metres in height.

Ground- and first-floor level architectural plans of Humayun’s Tomb.
ideal, inspired by Emperor Babur’s love for enclosed gardens. Tall, arcaded, masonry walls define the northern, western and southern sides while the River Yamuna formed the eastern edge of the Tomb-Garden. The north-east corner of the Tomb-Garden enclosure is formed by the fourteenth-century chillīghā, or meditation chamber, of the saint Hazrat Nizamuddin Auliya, defining the location of Humayun’s mausoleum, set in a sacred landscape.

Other factors that seemed to have helped Emperor Akbar choose the site for the mausoleum were the proximity of the Dargah of Hazrat Nizamuddin Auliya as well as the site being on the River Yamuna and the sixteenth-century Grand Trunk Road. Both the river and the road would have served as transport arteries to bring the vast quantities of stone required for the building – quartzite from the Delhi region; red sandstone and white marble from three hundred kilometres away. The proximity of the Purana Qila – which would have served as the Delhi fortress during Akbar’s frequent visits to the Dargah and in turn the construction site – would also have led to the site being favoured.

Geological investigations carried out during the garden restoration of Humayun’s Tomb also reveal that the grand mausoleum stands on a rocky outcrop, providing a stable foundation in a seismic zone. This rocky outcrop also formed a river island on which stands the garden-tomb of Nila Gumbad – seemingly the earliest Mughal-era structure to have been built in Delhi. The western wall of its garden enclosure was later incorporated as part of the eastern enclosure of Humayun’s Tomb, with a corner gateway giving access from one to the other.

The principal gateway to the Tomb-Garden stands in the centre of the southern enclosure wall while another monumental, if smaller, gateway is located on the western side, the latter today serving as the principal visitor access. The centres of the northern and eastern sides are marked by pavilions, built in masonry and finished with lime plaster, unlike the gateways that are finished with dressed stone.

With the principal gateways standing in the centre of the enclosure walls, which themselves are oriented in the cardinal directions, the mausoleum has north-south and east-west axes. However, with the corners of the tomb structure chamfered at the three main levels – the lower platform, the arcade and the principal upper structure – the Mughal builders also introduced a strong diagonal axis that extends to the garden with octagonal pools emphasizing the four corners. Domed roof canopies accentuate the diagonal axis, which today is partially disfigured by the inappropriate planting of palm trees, in 1916, on the corners.

| 16 | The imposing South Gate, which served as the Royal Entrance. |
| 17 | Conservation works on the dome of Humayun’s Tomb required careful removal of cement from the joints of the marble dome and then filling the joints with lime mortar. |
The garden is divided into four equal quadrants with wide pathways – containing water channels – leading from the four cardinal directions towards the mausoleums, thus forming the first literal chahar-bagh, or fourfold garden. In the centre of each side are square tanks that contain fountains, originally fed by terracotta pipes bringing water from tanks or wells located outside the immediate garden enclosure. Each quadrant is further divided into eight square garden plots, with comparatively narrower pathways, also containing water channels. At the intersection of pathways are either additional smaller tanks, which also serve as silting chambers, or platforms that would have held the Mughal tents and on which trees such as tamarind were again inappropriately planted in 1916. Flowing water is the essence of the garden and some of the major platforms are surrounded by up to eight smaller tanks. The eastern stretch, located along the river, is sunken – possibly to allow for privacy when the royal tents were pitched here.

In the centre of the garden, Humayun’s mausoleum stands on a low platform paved with large blocks of quartzite, local stone sourced from Delhi. Each of the arched recesses of the ground-level arcade lead to chambers, intended as mini mausoleums, where over 160 Mughal family members lie buried, which has led historians to name the tomb the “Dormitory of the Mughals”. The actual grave of Emperor Humayun lies in a small three-metre-square room, and is in masonry covered with plain plaster, devoid of any ornamentation or inscriptions. Burial continued at Humayun’s Tomb up until the nineteenth century and Shah Jahan’s son, Dara Shikoh, as well as at least four of the later Mughal emperors lie buried here.

A red-white contrast fashioned by the clever use of sandstone-marble on the facade creates a striking composition. The white plaster on the lower arcade is meant to mimic marble but even here red polychromy is used to highlight the ornamental incised plasterwork. Furthermore, the red sandstone lattice screens over the doorways on the lower arcade have an ‘inlay’ of white lime plaster, taking the red-white contrast to minute architectural detailing.

Though the red sandstone and white marble, used in great quantities and imported from a great distance, have so far been considered only as cladding on the random rubble masonry walls built of quartzite, these stone blocks are fifteen to twenty centimetres thick and horizontal stone bands are embedded in the random rubble masonry up to fifty to sixty centimetres thick, thus suggesting that these are part of the structural system. The sandstone arches on the lower arcade, as well as the grand sandstone half-domed vaults on the northern, eastern and western facades, further underline the structural nature of what has, until the recent conservation effort, been considered to be cladding.

Planning for conservation
In 1997, with the intention of undertaking the garden restoration, AKTC commenced a major programme to source archival material related to Humayun’s Tomb and its setting. The study of Mughal chronicles and research at the ASI archives in Delhi and Agra, the National Archives, the British Library, the Canadian Centre for Architecture, the Rampur Raza Library and the Victoria and Albert Museum, among other institutions, revealed significant information that has informed both the garden
restoration and the subsequent conservation of the mausoleum and attached structures. A continuous record of photographs now exists from 1849 onward and similarly all conservation efforts from 1860 onward are known, as are major earlier events at the mausoleum, since its building in the mid sixteenth century.

Often, archival research and building archaeology have helped define and justify removal of later alterations, such as the concreting over the stone blocks of the lower plinth and the installation of stone lattice screens of inferior quality blocking the access to the four corner chambers from the principal tomb chamber.

Archival research has been substantiated by exhaustive documentation and condition assessment, including structural assessment. A high-definition survey using 3D laser-scanning technology was used as the basis on which a stone by stone assessment of the entire facade was completed prior to commencing conservation works.

The scale of the conservation effort proposed at Humayun’s Tomb World Heritage Site, never before attempted in India, coupled with the need to return to a craft-based approach to undo the inappropriate twentieth-century alterations and restore material authenticity, necessitated periodic reviews of ongoing and proposed works by independent experts. Since conservation works commenced here in 2008, many outside experts, independently engaged by the Sir Dorabji Tata Trust, have reviewed completed, ongoing and proposed works. A ‘Core Committee’ was also formed at ASI with the mandate to review ongoing and proposed works each month.

With the restoration of glazed tiles on the canopies becoming a major undertaking requiring the revival of craft techniques, an international two-day workshop was hosted on site by AKTC in collaboration with ASI and UNESCO. The documentation, analysis and proposals were shared with forty participants from ten tile-producing countries prior to finalizing the conservation approach for restoration of the glazed-tile work.

Conserving the World Heritage Site
Since 2008, conservation works on Humayun’s Tomb have been based on available evidence and focused on restoring the architectural integrity of the mausoleum by using traditional materials, tools and building craft skills. The principal aim of the conservation effort has been to enhance the life of the structure as well as follow the original builders’ design intention to ensure that integrity and authenticity of material is not compromised.

A major effort has been undertaken to remove or undo the inappropriate twentieth-century and early twenty-first-century interventions, many of which had altered the structure as well as encouraged an accelerated decaying process. The conservation effort required in excess of 200,000 man-days of work by master craftsmen – stone-carvers, masons, plasterers, tile makers, carpenters – and has now included works to be undertaken on all parts of the structure.

Humayun’s Tomb boasts a grand double dome of a scale never before seen in India. The dome is surmounted by a six-metre-tall finial comprising copper vessels fixed on an octagonal wooden upright of twenty-centimetre diameter at the top of the dome. The outer dome was leaking and the plaster on
its inner surface had turned to dust piled over the lower dome. Conservation works thus commenced with the methodical removal of cement from the joints of the marble dome and careful pointing of the joints with lime mortar. The seasonal expansion and contraction of marble meant that the pointing had to be undertaken in winter, when the joints were at their widest. With the joints secure from rainwater penetration, the inner face was re-plastered with lime mortar.

Many sandstone blocks on the striking neck of the dome were found to be in a severely deteriorated condition, mostly owing to the cement pointing used in the stone joints in 1961–62. Several of the sandstone blocks – considered to have deteriorated beyond repair – were replaced, though alternate horizontal bands were found to be of a structural nature and embedded fifty centimetres or more within the masonry.

In the twentieth century, additional layers of concrete were laid on the roof and core samples taken at the onset of conservation works from the roof revealed over forty centimetres of excess concrete weighing in excess of one million kilograms that had to be removed from the roof to restore the original levels, expose buried architectural elements and in turn ensure effective water disposal.

Careful structural analysis preceded the commencement of the removal by first using a diamond-edged blade to make a thin twenty-centimetre-deep cut on a one-metre grid across the roof. Specially imported low vibration tools then widened the
cut to a gap of up to ten centimetres. Following this preparatory work, stone-carvers were employed to remove the concrete using traditional hand tools. A layer of lime concrete matching the original in composition – of brick aggregate, sand, brick dust and traditional additives such as fruit pulp and molasses – was then laid over the roof to the original slope and levels that could be easily defined by a careful study of recovered architectural elements.

At the onset of conservation works, fragments of tiles were visible on the smaller roof canopies. An early nineteenth-century painting of the mausoleum in the collection of the Victoria and Albert Museum in London clearly depicts the prominent blue of the central canopies with the white marble dome in the background. A careful scientific study of the tile fragments that had survived on the domed canopies unexpectedly revealed original patterns of the tile work.

Similar tile work was also found to adorn many of the structures within Humayun’s Tomb complex and the larger project area. Ceramic glazed tiles were used as inlay work, on the domes and canopies, in the parapet and moulding, in decorative medallions in the spandrels of the arches, and on projecting jarokhas or balconies to highlight the profile of the arches, among other elements. With the understanding that glazed tiles comprised a significant architectural element of the monuments
and probably served for the Mughal builders as a reminder of their Persian ancestry, AKTC commenced a three-year research programme, in 2009, to revive the lost craft skills and produce tiles exactly matching those of the Mughals. Over 20,000 samples were prepared in a process that commenced under the guidance of master craftsmen from Uzbekistan with youth from the adjoining Nizamuddin Basti now trained to produce these tiles, thus marking a revival of a Mughal craft. 

Once tiles with matching chemical and physical properties could be prepared, exhaustive deliberations on the appropriate conservation philosophy led to the agreement that tiles that had lost their glaze would be retained on the canopies and only where cement plaster had been applied in lieu of tiles would new tiles be inserted. Tiles have now been restored to the canopies of Humayun’s Tomb — serving their protective function as well as allowing visitors to understand the mausoleum as its builders intended it to be seen.

With conservation works complete on the roof, the attention of the craftsmen was turned to the principal structure of the mausoleum. The centre of each facade of this taller and is defined by a 13.6-metre-tall arch, with the southern arch treated differently to serve as the entrance to the octagonal tomb chamber. 

As William Finch, visiting here in the seventeenth century, described the tomb chamber: “... The sepulchre of Humayun is in a large room spread with rich carpets, the tomb itself covered with a rich ālamīyāna (canopy/tent) overhead, and in front certain books on small trestles, by which stand his sword, turban and shoes”.

The facade of this structure is also defined by the red-white contrast, with white marble borders inlaid in red sandstone. The sandstone blocks are laid to a strict pattern that could originally have been further emphasized by protruding lime mortar pointing, of which traces survive in portions of the facade protected from the elements.

Early twentieth-century texts describe the domed ceiling of the principal chamber covered with gilding. In 1914 it was written: “Traces can still be seen, in several places, of the original tile decoration, on the wall surfaces of the tomb chamber”. In the hope that fragments of tiles might have simply been covered with plaster, as was the case with the canopies, a careful manual scraping of paint and cement plaster was carried out, yet no tile fragments seemed to have survived the mid twentieth-century
Quartzite stone blocks, all weighing over 1000 kilos, were lifted manually and reset in the plinth with a lime concrete base. Removal of 20th-century cement layers from the lower arcade revealed star-shaped patterns in incised plasterwork. These were painstakingly restored by trained craftsmen.

The restored tomb chamber, which was covered in layers of cement plaster, was carefully re-plastered with a final 1-mm coat of lime and marble dust to restore its original appearance. No traces of the original tile work were found on the walls.

Recovery and restoration of the stone paving on the lower plinth using traditional tools and craft techniques.
repair. Ornamental plaster patterns were, however, revealed, with incised plasterwork in a netting pattern with red polychromy defining the edging of the archways both in the central chamber and the corner chambers. This decor was carefully restored. Cement plaster, as well as decayed loose lime plaster, was removed from all wall surfaces and replaced with a traditional lime mortar mix.

The facade of the principal tomb chamber includes white marble inlay in the predominantly red sandstone wall surfaces. In most descriptions of the Tomb by scholars, the sandstone is considered a ‘veneer’. However, with almost all stones being fifteen to twenty centimetres thick, and the thin horizontal bands embedded deep in the masonry, it can now be affirmed that the sandstone was fixed together with the masonry of the five-metre-thick walls.

Overlooking the chahar-bagh, a twenty-one-metre-deep sandstone terrace surrounds the main tomb structure. This sandstone platform serves as the roof of the vaulted chambers below and is not simply ‘paving’ at ground level, as it had been treated by past repairs, of which those carried out in 2004 were the most intrusive and least documented. The discovery of a plan of the sandstone paving patterns, prepared in the 1880s and thus prior to twentieth-century work, revealed that the paving pattern was linked to the projections of the tomb chamber and was thus as precise as the stone patterns on the facade.

Conservation works were based on the revelation that except for portions on the eastern and western sides almost all the paving had been altered in past repairs and it also became evident that stones with mason marks had been ‘shifted’ during earlier repairs. To prevent further water ingress to the vaulted chambers below and thus ensure long-term structural stability of the mausoleum, almost seventy per cent of the sandstone plinth had to be lifted and reset. In order to ensure that visitor movement continued uninterrupted, these works were carried out section by section in 2011–12. Since then, a continuous programme has inserted lime grout into the masonry below from stone joints in the paving.

Below the expansive terrace of red sandstone are the mini mausoleums – two bay, deep-vaulted cells – where 160 members of the Mughal family lie buried. Though the facing of this spectacular arcade is clad in sandstone with marble inlay, the ‘half-domed’ wall surfaces are plastered with ornamental star-shaped patterns. A doorway with a sandstone door frame allows access to the vaulted chambers beyond. Over each doorway is a sandstone lattice screen of a unique design that emphasizes the red-white contrast of the Tomb by filling in grooves in the thickness of the stone with white lime punning.

With water rapidly percolating from the terrace above, this level of the mausoleum required significant conservation work to be undertaken once the sandstone plinth above had been treated. Stains indicating water ingress were visible across the facade of the arcade and almost all the original lime mortar had disintegrated.

The arcaded facade required significant stone replacement, of the sandstone cladding as well as several of the corner pilasters. Much of the marble inlay that dated from the twentieth century, when small pieces were used, was replaced with longer sections of suitable stone. All stone works were carried out with traditional hand tools, to encourage craftsmanship as well as to match the finish and work of the sixteenth-century builders.

Cement plaster had been profusely used on the external and internal wall surfaces since the 1990s, even obliterating original
plasterwork where traces of this had remained. During 2002–04, as with several Delhi monuments protected by ASI, a pinkish plaster prepared with an unusual high proportion of brick dust with lime and cement was applied to the arcade. This not only disfigured the historic appearance and compromised material authenticity but also, due to its hardness, accelerated decay of the original lime mortar and sandstone elements. A first step towards conservation of the ground-level vaults was thus the careful removal of all cement plaster, both from the facade as well as from the interior wall surfaces. On several cells traces of the ornamental star-shaped plasterwork were found.

The inner vaults required over 18,000 square metres of lime mortar plaster and even the floor of the vaults had mostly disintegrated requiring a new lime-concrete flooring to be laid in all cells. Again, for most of the sixty-eight cells, the sandstone door frames were either missing or broken. With the wooden doors to these cells used for firewood by refugees accommodated in the Tomb-Garden in 1947, clearly the door frames were no longer considered necessary. Conservation works carried out since 2009 have restored sandstone door frames as well as wooden doors to all cells.

The principal conservation challenge, however, was to restore the ornamental plasterwork of the ‘half-domed’ surface which comprises less than one per cent of the facade yet is a prominent architectural feature. Once the pattern was carefully discerned by studying available evidence, several months of experimentation and training for craftsmen followed, prior to commencing restoration of the ornamental patterns in lime mortar. Lime plaster, applied in layers, then incised to bring out the desired patterns, transformed the character of the mausoleum, from ruin to splendour. The final layer of lime-marble dust mortar served as a protective layer for the underlying plaster; it was used by the Mughals to mimic the white marble of the facade of these mini mausoleums. The ornamental patterns in incised plasterwork were once again emphasized with red lime plaster obtained by adding geru powder, as had been the case in the principal tomb chamber.

The ground-floor arcade stands on a platform, rising 1.2 metres above the garden. In order to restore the architectural integrity and authenticity of material and form, as well as the historic character, a major campaign to remove the concrete and restore the stone paving of this platform was carried out. Hundreds of stone craftsmen worked tirelessly for over a year to lift the stone paving, bay after bay, followed by providing a lime-concrete base, to ensure that settlement does not reoccur easily, prior to refixing the stone blocks to the original locations and with an adequate slope. It was revealed that the Mughal builders must have commenced laying this paving from the southern entrance and moved in a clockwise direction, as the quality of the stone reduces considerably on the northern and eastern sides.

Nila Gumbad

The earliest Mughal-era structure in Delhi was built on a river island and its western wall later formed the eastern edge of Humayun’s Tomb-Garden. In the mid nineteenth century, the eastern half of the Nila Gumbad garden was taken over to lay railway lines, thankfully sparing this striking monument. In the 1970s the city’s principal sewerage lines were laid between Humayun’s Tomb and Nila Gumbad, requiring the arcaded northern retaining wall to be partially demolished. Following this intervention, the levelled ground began to be used as a road – through the protected area of the monuments.

The separation from Humayun’s Tomb led to poor control of the area, and soon over two hundred squatter families were residing within the Nila Gumbad enclosure. AKTC efforts, since 1999, have been to restore the linkage, especially since Nila Gumbad stands within the World Heritage Site boundaries. ASI relocated the resident families in 2003 and since 2007 discussions with the Railways have led to a ‘Memorandum of
The restoration of Nila Gumbad, which abuts Humayun's Tomb, required an extensive process of land acquisition to ensure that linkages with Humayun’s Tomb for visitor access were restored.

Elevation and plan of Nila Gumbad, Delhi’s earliest Mughal structure.
Understanding’ (MoU), in 2010, to relocate the road to the eastern side of Nila Gumbad thus ensuring visitor access to Nila Gumbad. Following this agreement, a major conservation programme commenced at Nila Gumbad with the support of the Sir Dorabji Tata Trust.

Conservation efforts commenced with restoration of the tiles of the dome, where over 15,000 tiles were missing. When attempts to get this large quantity of trapezoidal tiles made in Uzbekistan and Iran failed, the capacity at Humayun’s Tomb was significantly enhanced. It was observed that in past repairs tile fragments had been laid in plaster and there had been an attempt to keep the ‘blue’ by adding rubber sheets of colour matching the tiles. Cavities, up to a metre deep created by parakeets for nesting, were filled and the dome secured.

As with Humayun’s Tomb, the lime-wash layers and cement plasters, as well as the pinkish plaster of 2002–04, were carefully removed and replaced with traditional lime mortar. On the frames of the alternate arches in the neck of the dome, as well as on the wall surfaces of the half-domed corner niches, incised plaster with brick patterns was found, again a reminder for the early Mughals of the brick masonry of their homeland. This plasterwork is being restored.

A garden will be laid out on the lands secured around the structure, for which the northern and western arcades are presently being conserved. Vestiges found to the north of the arcade could represent a ramp built to receive stone brought by river for the building of Humayun’s Tomb.

**Project Impact**

Conservation challenges on structures undertaken for conservation by AKTC range from ensuring preservation to undertaking reconstruction of demolished or collapsed building elements. Most structures had undergone past repairs using inappropriate modern materials that had led to accelerated deterioration or at least disfiguration of their historical architectural character.

Return to a craft-based approach used in India for over a millennium was considered essential to restore the design intention of the Mughal builders and the grandeur of the monuments to the extent of evidence available. India is fortunate that traditional building craft skills, though rapidly disappearing,
are still alive and the conservation work undertaken since 2007 has created at least 500,000 man-days of direct and indirect employment for craftsmen: stone-carvers, masons, plasterers, tile makers, metal smiths and carpenters, among others. During this period ASI has revised the national conservation policy to emphasize the importance of building craft skills in the conservation of India’s built heritage.

Craftsmen have worked alongside a multidisciplinary team comprising engineers (civil, structural, hydrological, electrical), architects (landscape, conservation), designers, urban planners, urban designers, heritage management experts, art and architectural historians, archaeologists, social scientists and experts in finance, among others. Intense supervision of ongoing works, coupled with guidance to craftsmen to match the work of their forefathers, has ensured quality and created a model for policy makers for implementation elsewhere.

With an adequate understanding of the site acquired over a decade of involvement, AKTC will now embark on preparing a management plan for the site. This is aimed not only at a scientific management process being put in place but will also eventually seek extension of the World Heritage Site boundaries to include the twenty-eight-hectare Sunder Nursery in the north and Abdul Rahim Khan-i-Khana’s garden-tomb to the south.

With the proposed building of a modern Interpretation Centre at the entrance zone of the Humayun’s Tomb – Sunder Nursery complex, visitors to the site will come away with an improved understanding of the Mughal dynasty – its pluralistic traditions and social context, especially during Emperor Akbar’s reign – and the development of the Nizamuddin area over seven centuries – with an emphasis on Mughal art and architecture and the poetic/Sufi traditions that flowered here through the ages, making Nizamuddin the cradle of Hindustani culture.

Endnotes
2 Ebba Koch, Mughal Architecture, Prestel, Munich, 1991, p. 43.
3 RSOUV (Retrospective Statement of Outstanding Universal Value) submitted by the Archaeological Survey of India to the UNESCO World Heritage Centre in 2013. Not yet ratified and as such not published.