AGA KHAN CULTURAL SERVICES - AFGHANISTAN

FINAL NARRATIVE REPORT

Restoration and Stabilization of the Khwaja Parsa Shrine, Balkh

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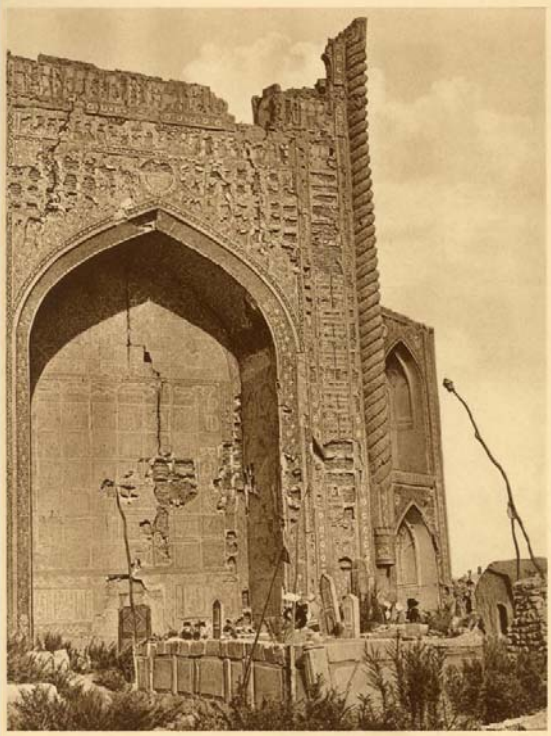

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1 SELECTIVE HISTORICAL BACKGROUND

The Khwaja Parsa Shrine reputedly holds the tomb of Khwaja Abu Nasr Parsa, a well-known proponent of the *Naqshbandi* order of Sufi Islam, which claims lineage to the Prophet Muhammad. Late 15th historical works repeatedly refers to Abu Nasr as a great mediator of peace negotiations and as the foremost representative of the historic Balkh population. Abu Nasr's death occurred between 1460 and 1461 though specific information about the nature or cause of his death remains unknown. No epigraphic evidence remains that identifies the characteristics of his original burial environment but, whether he was buried in a simple tombstone or the existing mausoleum, a series of structures by prominent Balkh residents were constructed in commemoration of Abu Nasr's life.

The existing structure is believed to be the family mausoleum commissioned in 1467 by Mir Mazid Arghun. Arghun, a prominent Timurid politician and military leader, is believed to have chosen Abu Nasr's burial site as the location for his mausoleum. Scholars contend that Abu Nasr himself was buried either in front of the *iwan* portal or in the area of the *takht*. Mir Mazid is also believed to be buried in the structure's immediate vicinity in honor of Abu Nasr.

Abu Nasr's legacy remained strong, with additional expansion of and construction in his gravesite continuing for generations. His great grandson, Abd al-Hadi, implemented the first of several phases of restoration to the structure. A madrassa was added near the shrine, and helped spark the formation of a 'madrassa district' during the late 15th to late 16th centuries around the mausoleum itself.

However, the mausoleum soon fell subject to gradual disuse and physical deterioration sometime after the 16th century. Little information exists on the state of

the structure during the 17th century, with foreign travelers arriving only in the 18th and 19th centuries during which they recorded information on the mausoleum's structural state via photographs and written records. These images provided the AKTC teams with vital information about the original structure of the mausoleum, a particularly important contribution given that the structure underwent several additional programs of intervention.

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The mausoleum, holding an important place in the historic fabric of the region, was repeatedly repaired, renovated, and expanded since its original construction. However, interventions were not thorough, and were sometimes harmful to the original structure of the mausoleum. With support from the German Federal Foreign Office, in 2011 the Aga Khan Trust for Culture commenced a project to undertake comprehensive restoration and stabilization of the Khwaja Parsa Shrine with respect to its historic character.

2 OBJECTIVES AND APPROACH

The comprehensive restoration approach constitutes a sustained undertaking to rehabilitate a monument important to the historic fabric of the Old City of Balkh and to the local inhabitants utilizing the distinctive space as a mosque and madrassa. The conservation works undertaken by the AKTC aim to achieve the following primary objectives:

- Safeguarding, restoration and stabilization of a site of national historic and religious significant;
- Promotion of awareness and understanding among Afghans of the significance of their built heritage;
- Develop the skills of Afghan professionals; and
- Establish a plan for the sustainable management of the site.

All activities comply with AKTC core principles, which focus on the protection and safeguarding of the country's historic sites in a sustainable manner and with the full support and involvement of the local community and institutional partners. Activities are undertaken with the cooperation of relevant authorities, including various departments of the Ministry of Information and Culture, and adhere to the provisions of the Cultural Heritage Laws of Afghanistan and International Charters on conservation.

3 PROJECT ACTIVITIES

This final report on the Restoration and Stabilization of the Khwaja Parsa Shrine in Balkh Province contains a narrative report relaying a summary of works completed during the fiscal years of May 2012 - August 14.

3.1 Project Planning

An expert survey team consisting of experienced AKTC staff from Afghanistan and Pakistan traveled to the site in the summer of 2011. The team conducted an initial investigation into the status of the Khwaja Parsa Shrine and Balkh Park over the course of 3 weeks in order to assess the state of the existing structures. They took general measurements of the historic mausoleum and modern mosque and recorded information about the material used to construct the structure. The information

gathered was used to create an initial cost estimation of the project according to local labor and material costs. This initial survey provided the opportunity for the team to train local surveyors and engineers in specialized surveying techniques, increasing the capacity of the Afghan team for future work on the shrine.

During this time, the team conducted preliminary discussions with representatives of the local community in central Balkh, providing explanations about their surveying work and the eventual intention to conduct extensive restoration efforts. Community leaders as well as residents visiting the site demonstrated their support for conservation works, often citing the mosque's lack of structural integrity as a potential harm to residents and the importance of restoring their historic sites as major reasons for their approval. The community was further useful in providing the teams with additional information about the area and the various construction interventions that had occurred over the past 30 years. Establishing this dialogue with the local community and securing their support was instrumental at later stages of the project.

The team returned to the site in March 2012 to continue planning efforts, setting up several surveying benchmarks and establishing contact with the local municipality. Following indications that project resources would become available through the German Federal Foreign Ministry, formal discussions took place with staff of the Ministry of Information and Culture and AKTC officially announced intentions to commence a restoration project on the shrine. The team also convened a meeting with several key leaders, including the mullah of the mosque, District Governor, Mayor of Balkh, and local community members, in order to share their plans for the area and attain support at the local level. Project personnel explained their expected timeline; designs for the demolition of the modern mosque and the construction of a traditional and structurally sound mosque; and periods during which the area would

be closed off to the public as a safety measure. The proceedings also included a presentation of previous sites restored by AKTC in Herat and Kabul, establishing that the team had vast experience in conservation in Afghanistan. Community representatives and local officials responded very positively, providing their full support for the planned activities, expressing that the works were in their best interests.

3.2 Mobilization

Additional project management and technical staff were identified and engaged for the conservation efforts, most with extensive experience in Timurid era conservation in Herat, led by the technical team that led the restoration of the Ikhtyaruddin Citadel and the Abdullah Ansari shrine (German Government funded) in Gozargah. With the recruitment of local support personnel, skilled craftsmen and daily labourers, project activities officially commenced in May 2012. In total, approximately 2,000 work-days for skilled laborers and 6,000 work-days unskilled laborers of employment was generated through this grant for the 8-month period in 2012.

As a sign of community support, the Mullah of the mosque located at the Khwaja Parsa Shrine gave permission for the use the mosque's large metal container for the storage equipment, materials, and items recovered from the Shrine (such as bricks and historic tiles). AKTC purchased two additional metal containers to store project materials. Together with the establishment of a site office, the provision of utilities and site facilities, and the procurement of additional equipment and supplies, the teams commenced preliminary enabling works in May and June.

3.3 Site Preparation and Enabling Works

After teams were trained, a number of preliminary activities were implemented in order to prepare the site for conservation measures:

1. **Historic tiles:** Laborers gathered original historic tiles that had been removed and disposed of randomly within the structure during previous interventions. These tiles were sorted and older historic color glazed tiles were stored in separate wooden containers with the aim of re-using them during later stages of conservation. In total more than 50 boxes of various sized tiles were retrieved from the structure.

2. **Collection and disposal of waste:** In total, 7 unskilled laborers worked 1,344 hours over the course of a month to remove excessive build up of waste, including pigeon droppings and carcasses that had accumulated within the dome and iwan portal areas of the shrine. Waste was used as compost for planting in the surrounding park whenever possible, while other items were appropriately disposed of outside the project site.

3. **Clearance of debris:** A large amount of dirt, soil and garbage had accumulated both inside the Shrine and its surrounding area. Approximately 8 unskilled laborers worked for 2 weeks to gather all material and transport it outside of the city, where AKTC teams – in collaboration with local authorities – identified an appropriate dumping site. Teams cleaned the material in and around the Shrine, eliminating waste in the area in order to begin physical construction work.

4. **Security Fence:** A 150 meter-long security fence was constructed behind the mosque and a guard was employed to monitor the site throughout the restoration efforts. The fence, 2m-high, was later partially replicated in front of the site once the modern mosque was demolished. Prior to demolition, the mosque was left open for public use, and was thus not yet fenced off by the conservation teams.

These works were conducted alongside continued discussions with the local community in order to keep them fully aware of the project's progress. Local community members and leaders were permitted to view the site, first from within the Shrine and then from a short distance (once active construction had begun, rendering it unsafe for unregulated foot traffic). The team routinely conducts tours of the project for visiting dignitaries and project partners.

The area became unsafe for close viewing once teams erected intricate scaffolding. Scaffolding focused on 2 areas: (1) the 12.92m-high dome and (2) the 25m-high iwan portal. A team of 10 laborers erected the scaffolding over the course of 2 months, carefully matching the curve of the dome and ensuring access points for laborers and visitors to the mosque. Scaffolding was erected around the full circumference of the dome and *iwan* (portal).

Previous modern interventions introduced included the construction of a large area of concrete paving near the base of the mausoleum and on the sides of the main portal. Several long trenches were dug at the base of the structure and investigations revealed significant water-log problems beneath the concrete surface. As concrete has non-porous properties, the material prevented the natural evaporation of water and may have contributed to the structural problems caused by settlements at the base of the shrine. Teams removed the portion of the concrete floor that was directly in front of the structure, facilitating the evaporation of moisture from the damp soil beneath. Excavations also revealed that the foundations of the Shrine were constructed in baked brick and extended some 4-meters beneath the current ground level. As the water table in Balkh – located on flood-plains – is very high, this may have also contributed to the structural settlement in the main portal area.

3.4 Demolition of Southern & Northern Wings of Concrete Mosque, Archaeological Excavation, and Reconstruction of Historic and New Mosque

Once the site had been fully prepared, physical rehabilitation efforts began. The modern mosque (South & North wings) , constructed during late 20th century on the northwest and southeast elevations of the mausoleum, had a number of notable design and build faults rendering the structure increasingly dangerous for its use as a community prayer area. The area of the new concrete mosque was previously

occupied by a 19th century structure used for the same purpose. The size, location and construction materials (concrete and steel) of the new mosque are in clear contravention of international conventions governing what can be build in the vicinity of historic monuments. In addition to this, the structure also posed severe risks to the stability of the adjacent shine because of water-log problems beneath the structure. It became evident that the immediate removal of the existing building was necessary in order to secure the structural stability of the shrine. The objective would be to reconstruct the previous historic structure in place of the concrete mosque (north wing), in recognition of the needs of the local community for place of worship, and a new mosque (north wing) built using traditional materials and forms – ensuring that the structure also provides much needed buttressing support for the adjacent shrine.

The activities under this component of the project would be carried out in the following order: **(a)** ***generate community support for the demolition of the concrete mosques*** and reconstruction of the traditional architecture, **(b)** ***demolition of the concrete mosque***, **(c)** ***conduct archaeology and documentation of the area under the concrete mosque*** to base the reconstruction on historic evidence, **(d)** ***phased reconstruction of the mosque wings*** – first the historic southern wing followed by the new designed northern wing, **(e)** ***phased handover of the mosque*** for use by the community.

(a) Generate community support for the demolition of the concrete mosques:
In recognition of the sensitive nature of the proposal to demolish the modern mosque and construct a traditional mosque, the teams convened a meeting with community and municipal leaders during Friday prayers in order to relay plans and receive community input and support. The team also approached a number of key counterparts, including the head of the Department of Historic Monuments in Balkh Province, Haji wa Awqaaf (Ministry of Religious Affairs), Mayor of Balkh and Balkh District Governor, to again share detailed information about their plans. The community and key actors both endorsed the plans and were invited to participate in a ceremonial commencement of demolition activities, during which they were given hand tools and began destruction of the modern mosque in preparation for its future re-construction.



(b) Demolition of the concrete mosque:
Once full community support was evident, a team of 30 workers used hand tools to demolish the south wing of the concrete mosque over the course of 20 days. It was during this time that the security fence was extended to include the southeast elevation to prevent any potential accidents involving the public. During demolition, hand tools were used to limit noise and dust affecting the community and to minimize further damage to the mausoleum structure.

First, the concrete roof of the south wing of the Mosque – covering 63m^3 including its slab, beam and columns - was removed, and steel ties were cut revealing extensive damage to the mosque's integrity. Approximately 34m^3 of walls and 36m^3 of the foundation were also removed. The existing base of the mosque had been previously constructed using 8 course brick and rubble piers, and was determined unstable for continued use. Construction efforts in 2012 entailed excavating existing piers of the existing mosque to their base levels (between 2.00m – 2.70m). Total excavation covered 545m^3 of the foundation and floor space. Rubble from the demolition was re-used where possible and what remained was disposed of off-site. Steel re-bar reclaimed from the structure was stored and used later to form 614m-long drainage pipes for the surrounding park. Concrete was recycled for the city's road paving projects, and bricks were stored for the re-construction phase.

Once the concrete mosques had been dismantled, work began on archaeological excavations and the collection of data as a precursor to the reconstruction of the historic structure.

(c) Archaeology and documentation of the area under the concrete mosques

Prior to beginning the reconstruction of the historic mosque, an expert team supervised by a British archaeologist conducted extensive excavations on the site of the demolished mosque. The purpose of the excavation was to identify portions of the surviving structure of the historic mosque to be used as a basis for the design of the reconstruction. In addition to uncovering the foundations and segments of walls of the historic mosque that had occupied the site until the early 20th century, a number of additional walls and tiled surfaces were identified and recorded.

Upon the completion of the archaeological team's work, the uncovered archaeological pits were re-filled with a mixture of lime and re-used rubble in 50cm layers, with each layer being compacted and left to harden for 2 days before the next layer was added. This traditional process, while slow, provides a robust foundation for future phases of construction and helps prevent rising damp in the structure. The process further included the removal of 670 m^3 of earth, and its movement up to 250m from the site for storage for future landscaping initiatives. The area of the modern intervention was fully cleared and data collected would enable an accurate reconstruction of the historic mosque.

In total, an area of 432 square meters became the focus of archaeological investigations and was cleared of debris and rubble.

d/e) Phased reconstruction and handover of the Southern and Northern wings of the mosque:

Commencing in the summer of 2013, the reconstruction of the historic mosque (south wing) was completed by the end of the year and the building was handed back to the custodians of the Shrine. For the southern wing of the mosque, documentary and archaeological evidence, together with historical references including photographs of the area in the early 20th century showing the previous building that had occupied the site, became the basis on which building designs were prepared and the reconstruction executed. Building foundations were constructed where archaeology had revealed as being the location of previous foundations. The external load bearing walls were designed with the same thickness and heights of the original construction. Remnants of the springing of the arches and geometry of the dome were visible on the external elevations of the historic Shrine building. This information together with historic photographs showing the number of bays, arches and domes of the destroyed mosque, enabled the construction team to accurately design and construct the arches and domes of the building. Using traditional materials (specially fabricated 23 cm x 23 cm baked bricks, lime mortar, and cedar wood) and generating building designs based on visual and archaeological evidence and the application of standard geometrical formulas and proportions that were employed in the rest of the building, the newly built mosque represented an accurate reconstruction of the original structure that stood on the site. Upon the completion of major structural and building shell works, the focus shifted to paving the external surfaces of the domes, the internal areas used for worship and on the production of doors and windows that would weather-proof the new mosque. A layer of lime concrete protected with waterproofing materials that allows water to evaporate has been applied to the entire surface of the reconstructed mosque before it was finished with backed brick paving.

Based on an agreement with the community, the demolition and construction of the south and north wings of the mosque would be carried out in phases so as to not interrupt the use of the buildings for prayer and gathering. Based on the complexity of the reconstruction of the historic mosque (south wing) the agreement was that AKTC would start its work from this structure. Simultaneous to the reconstruction of the south wing mosque, AKTC teams planned and designed the intervention on the north wing mosque that entailed the construction of a new building to replace the dilapidated concrete structure. Once the south wing mosque was reconstructed and usable by the community, the teams focused on the construction of the north wing mosque. In this manner, AKTC teams ensured that community support, based on their access and use of the mosque, continued to be provided for the project.

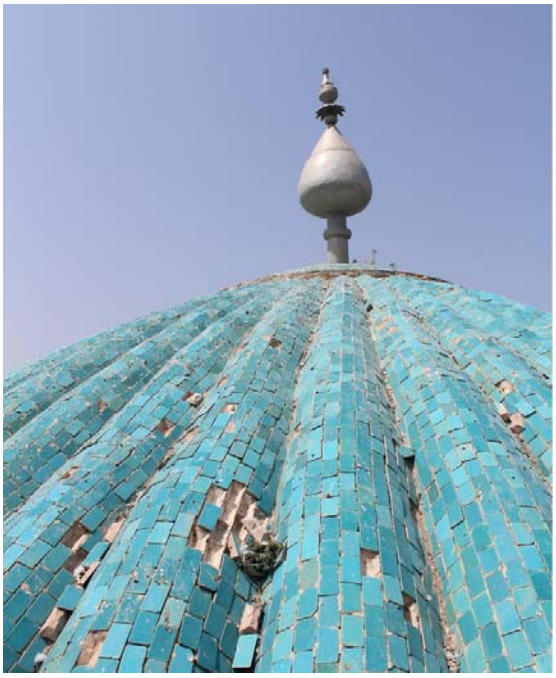
Once the southern mosque became operation and was regularly used by worshippers, the project team began the demolition of the northern wing of the concrete mosque, removing more than 85m3 of concrete and steel reinforcement and 130m3 of masonry walls, with the aim to construct a new mosque using traditional materials and building techniques. The reconstruction of the historic southern Mosque and the construction of the new northern wing in traditional materials represent a major intervention in the site of the historic Shrine, transforming the dilapidated construction which presented dangerous conditions for worshippers into one of the safest spaces for prayer and communal gathering in Balkh. The reconstructed wings contribute to the structural safeguarding of the existing Shrine, acting as buttresses for the main *Iwan* and Minarets of the early 17th century building.

In total more than 460 cubic meters of stone masonry and 3000 cubic meters of brick masonry was used in the construction of the southern and northern wings of the mosque. Additional works included the application of more than 1400 square meters of baked brick paving on the roof and the internal flooring, the fabrication of 85 square meters of doors and windows, and the pointing of 3700 square meters of surfaces on internal and external elevations and brick flooring. Provisions for appropriate levels of electrical outlets, switches and lighting were incorporated into the building during construction works. The baked brick masonry and paving works required the fabrication of more than 750,000 specially designed bricks based on sizes used in historic constructions. In total more than 2300 cubic meters of sand and 360,000 kilograms of quick lime was used over the course of conservation and construction works.

3.5 Structural consolidation, restoration, & retiling of the Dome & Muqarnas

The impressive 56-ribbed dome has thus far been subjected to at least 6 phases of collapse and rebuild since its mid-15th century construction, with the latest intervention occurring in the late 1960s. The two-shell structure, unique in the architectural landscape of northern Afghanistan, has remarkable similarities to the Gowharshad Mausoleum in Herat and may have been built in the same period. Unfortunately the current dome, partially rebuilt in the 1960's when the building was last restored, has poor structural integrity caused by several factors, including the removal of several internal support structures and tampering with the brick masonry architecture. Further damage was further compounded when the external ribbing was last retiled, when baked bricks from the surface of the dome were inappropriately cut in half - reducing the depth of the dome in areas and further weakening the structure.

Research into the architectural styles and building techniques of the 15th century reveal that the space between the inner and outer dome would have likely have included an additional supporting timber structure. The missing timber structure would have been in the form of a central timber pole rising from the top of the inner dome and exiting through the azimuth of the outer shell, and have included an additional two rings of radiating horizontal timbers fixed between the central pole and the sides for lateral support. The central pole, as noted, was missing at the time of the AKTC technical team's investigations, which further indicated that the pole's fixing for its base was still present. Teams also identified remnants of the radial timber structure at the base of the internal dome and sheer walls. Investigations also indicated that a *Khash Khashi*, a traditional brick structure common to 16th and 17th century architecture in the region, was constructed in order to provide additional support for the dome. Remnants of six of these vertical brick structures were also identified, though the structure itself was primarily dismantled during previous restoration efforts.



Although not all of the current structural concerns stem from previous conservation effort. The original construction also has several defects such as the fact that at its base the dome rests on a 26cm wide row of bricks. A construction of this size would today require at least a 39-52cm thick or 3-4 rows of brick masonry at its lower extremities. In addition to structural damage to the dome itself, inappropriate conservation techniques in the past have resulted in the use of sub-standard mortar material when applying the glazed tiles to the external surface of the dome. This has resulted in extensive cracking of the mortar and the dislodging of the tiles from the curved ribbed surfaces. When sections of the loose tiles were removed it became evident that previous retiling had taken place above existing tiles surfaces. In other words – like coats of paint added in layers over time, the tiles had been applied in several layers each time on top of the previous layer. This adds significant load to the already weaken dome structure. Removal of these tiles also revealed that the surface of the dome was flat – i.e. that the ribbing had simply been formed by shaping the mortar beneath the tiles into curved shapes.

In order to proceed with the structural consolidation of the dome, in consultation with staff of the Department of Historic Monuments, it was decided that several actions would have to be taken if we were to ensure that the dome remains structurally stable in the future; **(a)** ***reconstructing the previous structural support elements*** that had been removed over time including the vertical masonry walls and the timber tensile structure beneath the dome, **(b)** ***removal of dead-load*** from the dome that had been applied during several unsuccessful attempt to retile the structure, **(c)** ***structural "stitching" of large cracks*** discovered on the dome, **(d)** ***construction of external masonry "ribs"*** in order to increase then thickness of the dome and to provide the base for the application of new tiling, **(e)** ***production of high-quality tiles,*** **(f)** ***the retiling of the Dome & 'Muqarnas'*** using newly produced high-quality

tiles, and **(g)** ***application of new tiles using innovative techniques***, including a structural glass-fiber mesh foundation, the “stitching” of tiles using glass-fiber strings, the use of silicon adhesive in the joints of the tile work and use of high-quality mortar materials. To this end the conservation team carefully removed the loose tiles and the sub-layers of infill materials from the surface of the dome. Simultaneously they commenced the construction of masonry ribs that helped provide structural support. This ribbed structure was “tied-in” to the surface of the dome and the interlocking of these structures increased the depth of the masonry dome – simultaneously increasing its load-bearing capacity. A geotextile mesh was inserted between alternating rows of bricks in order to ensure additional compressive strength. An order was placed for the production of more than 80m2 of new high-quality glazed tiles with a local manufacturer with extensive experience in producing high quality glazed tiles. An additional 120m2 of tiles was later produced directly by the tile workshop established on site.

(a) Reconstructing the previous structural supports:
As described, physical documentation and analysis of the space directly beneath the main external tiled Dome of the Shrine, revealed that large sections of the historic wooden tensile supports beneath the Dome had been either removed intentionally or collapsed as a result of previous damage and were not reconstructed. Teams responsible for the previous reconstruction of the dome had either not been aware of the existence of this structure or had simply chose to ignore this during their work. By “covering” over indications of serious structural problems, such as re-pointing tension cracks caused by the deformed dome, without undertaking appropriate structural consolidation, these teams also made the task of monitoring the structure and identifying problems much more difficult.

When further investigations revealed that the structural condition of the large masonry Dome was tenuous, project personnel made the decision to reconstruct the wooden supports with the aim of strengthening the main Dome ahead of additional consolidation and retiling works.

Following the calculation of material loads and forces, designs were prepared for the construction of the wooden supports. Based on these, large timber poles, which would have been used in the previous structure, were sourced locally. A small metalworking workshop was built in order to produce bespoke metal ties and joints that would hold the timber structure together. (Provide Image) Skilled teams of carpenters, masons and metalworkers were employed to construct the support structure before consolidation works could be carried out on the masonry Dome itself.

Based on the existence of evidence indentifying the location of the base of the previous timber structure and areas where it had connected with the masonry dome, a central pole was constructed above the internal Dome, which was assessed to be in good condition, and tied through the azimuth of the outer shell. From this central "trunk", like that of a large tree, two rings of radiating timber poles were extended systematically and linked to key locations of the external dome. This network of timber supports will ensure that loads from the Dome are transferred laterally to key areas of the Drum and should improve the performance of the structure during mild earthquakes.

Remnants of six *Khash Khashi* or vertical brick "fin" structures placed radially at the base of the external dome were repaired and re-pointed. Together with the construction of the timber supports, these measures will ensure that the Dome is safeguarded for the foreseeable future.

(b) Removal of dead-load from the Dome:

While AKTC teams expected to discover structural masonry ribbing on the external face of the main Dome and beneath the glazed tiled surfaces, initial investigations revealed that the "ribbed" shape of the tiles was produced by filling the cavity between the tiles and the masonry structure with plaster mortar and infill material including pieces of brick. It was also discovered that the brick surface of the masonry dome had been carved back in areas up to 20 centimeters during previous re-tiling projects and in an attempt to reconcile the geometry of the tile ribs with the surface of the brick Dome. The reduction in the thickness of the masonry of the Dome presented the most immediate structural concern, which in areas had resulted in the formation of large vertical cracks in the brickwork.

Considering the poor state of the glazed tile finishing on the Dome, it became imperative that the dead-load beneath the ribbed tile surface be removed as quickly as possible. This work needed to be undertaken simultaneously from all sides of the Dome in order to reduce the irregular distribution of loads on the weakened surface which may have resulted in its collapse. Once the removal of the damaged tiles and

infill material was completed, the technical team was able to fully assess the condition of the masonry structure and design suitable stabilization measures.

(c) Structural "stitching" of large cracks:

Minor earthquakes, the removal of timer supports, the cutting back of the thickness of the masonry and the addition of dead load on the surface if the masonry had all contributed to the formation of large vertical cracks in the brick structure of the Dome. In one instance, the space between a single crack that ran across the height of the Dome was more than 10 centimeters at its widest point. It became evident that previous efforts to re-tile the Dome had simply covered up such defects in the structure. It became immediately evident that the long-term safeguarding of the Shrine and Mosque depended on the consolidation of the Dome. Had the structural defects gone unaddressed, it would have simply been a matter of time before the Dome had collapsed as it had done on several occasions in the past.

Having already improved the structural integrity of the Dome through consolidation and reconstruction works undertaken internally, masons commenced the urgent task of removing debris and damaged masonry from within the structural cracks and preparing the area for repair works. The work of "stitching" the masonry together required the careful removal of bricks on either side of the cracks and the laying of new bricks that wove the new and old masonry together. In order to reduce the risk of further damage to the structure, this was undertaken in segments of less than 1 meter at a time and the masonry was allowed to dry, gaining sufficient strength, before the next segment could be repaired. In total more than 40 linear meters of structural cracks were repaired in this manner.

(d) Construction of external masonry "ribs":

As dome above the main Shrine had been severely weakened through inappropriate interventions in the second half of the 20th century culminating in the "cutting back" of the thickness of the brick masonry during the most recent intervention, it was agreed between project partners that additional measures needed to be taken in order to strengthen the construction. A detailed structural analysis of the dome revealed that

the most suitable course of action was to increase the thickness of the masonry dome in areas where the structure had been reduced or “cut back”. As a full dismantling and reconstruction of the dome was neither desirable nor technically feasible, project architects designed an ingenious (and intuitive) measure that would simultaneously add depth (equaling additional load-bearing strength) to the masonry dome, reduce the overall dead-load, and provide an ideal base for the application of coloured glazed tiles as per original designs.

The solution lay in filling the cavity between the ribbed tiled surface and the smooth surface of the dome beneath, previously in-filled with rubble material, with structural masonry ribs that would be woven into the precariously thin masonry of the dome. In practice, this solution would provide a structural exoskeleton for the dome, while providing a solid regular base for the application of glazed tiles. Once the solution had been designed, it needed to be tested and appropriate materials and techniques for the construction of the structural ribs needed to be selected. Based on initial mock-ups and samples and the documentation of results, it was concluded that the measure would suffice to add significant strength to the dome.

Over the course of 6-months and at a height of more than 26 meters above ground, teams of masons worked to construct 56 brick masonry ribs using specially designed forms to help guide the overall shape of the ribs. As the masonry ribs would eventually be covered by small glazed tiles, the tolerance for deviations in the overall shape and trajectory of the curves were minimal. While masons worked to complete the masonry ribs in situ, teams of craftsmen works to produce formworks and fabricate the glazed colour tiles that would eventually cover the large dome and ribs.

Additional measures employed during the course of works to strengthen the main dome of the shrine included the installation of two layers of an 80 centimeter wide glass-fiber mesh “belt” around the circumference of the dome, providing additional support at key locations where the transfer of tensile forces would be highest.

Considered as one comprehensive structural consolidation intervention, the reconstruction of the timer structure and the *khash khashi* beneath the dome, the repair and stitching of cracks in the brick masonry, the construction of a ribbed masonry exoskeleton and the provision of a glass-fiber mesh “belt” collectively add considerable strength to the dome. The last measure entails the retiling of the dome, ensuring that the structure is protected from rain and snow.

(e) Production of high-quality tiles:

(This section of the report outlines in detail activities carried out under this Grant and under a separate addendum to the Khwaja Parsa project - ref: “Repair and Conservation of Glazed Tiles – Khwaja Parsa Shrine, Balkh”)

Based on an analysis and detailed condition assessment of the glazed tiles covering the main dome of the shrine, it was decided early in the restoration project that parts of the dome would have to be re-tiled using higher quality glazed tiles that were applied in a more durable and lasting manner. While initially it was not expected that the complete surface of the dome would require retiling, upon further investigation of the building it was discovered that the method of applying existing tiles was inadequate and would result in the detachment of the remaining sections in the near future. When considered in the context of the condition of other tiled areas in the *Muqarnas* directly under the dome, the cylindrical Drum, the two Minarets and the

Iwan main portal, a condition assessment was prepared and shared with the German Embassy together with a proposal seeking an expansion of the conservation works to include significant conservation and consolidation work on the glazed tiles of the Mosque and for the production of high-quality new tiles to be used in areas where original tiles had disappeared.

Upon the approval of the addendum, initial activities required detailed documentation of existing tiles in order to record variations in the type of tiles used in the mosque and analysis of the qualities and methods of baking clay and applying coloured glazes. Additional research was undertaken to record the different methods used to apply the tiles to the dome and vertical surfaces, including the use of formwork. The information collected during this process was recorded and used to ensure that new tiles produced under the project both matched the visual characteristics of the historic tiles and were of a sufficiently high quality so as to be employed in the consolidation works.

An on-site tile workshop was established and included various areas required for the production of glazed tiles. The process of making glazed tiles requires the mixing of specially procured soil to produce appropriate clays followed by the use of wooden formwork to make unbaked clay tiles. In order to ensure that the appropriate type of clay was used, several sources were identified and extensive tests on the soils from these areas were undertaken. Once the unbaked tiles are removed from the forms, they are sun dried for at least a week before they are stacked carefully, with sufficient space between each tile, inside a specially designed cylindrical baking kiln to receive the first baking. The kiln is lit using *safidar* wood, a locally procured type of Poplar that burns quickly without producing large quantities of ash or smoke that would otherwise discolour the unglazed tiles. Depending on the thickness and size of the clay tiles, the total baking time ranges from 10 – 16 hours at a temperature of 850

degrees Celsius. The unglazed tiles are then left to cool within the kiln over a period of three days so as to avoid cracking resulting from significant drops in temperature. Once this process has been completed, the tiles are removed and stored at room temperature. Following this process, the baked tiles are prepared and cleaned in order to receive a layer of coloured glazing. Various coloured glazes were used in the original tiles of the Mosque and needed to be accurately reproduced including white, black, yellow, turquoise, and lapis lazuli blue. Each colour required careful preparation and collection of information on the mixing of base materials (oxides from lead, tin, cobalt, copper and manganese) and the preparation of the final surface glaze using locally sourced micro-silica material. Once glass was produced from the micro-silica materials, it was ground and added to the metal oxide to produce the final coloured glazes. These glazes were then applied by hand using brushes to the baked tiles requiring multiple colours (*haft-rangi),* such as those used in the Muqarnas or on internal elevations. Where a single coloured tile was required, such as on the dome, drum and Iwan, these tiles were dipped into a mixture of coloured glazes.

Baked tiles that had received a painted layer of coloured glazes needed to be placed again inside a kiln and heated in order to have the glazes fired permanently onto the surface of the tiles. As these tiles could not be stacked within the kiln and must lay with the glazed surface facing up without being in contact with other tiles, a second stepped kiln was specially designed and built. This kiln was fired to a temperature between 900-1100 degrees Celsius and the tiles were baked for approximately 10 hours. With different colorus and sizes of tiles requiring more or less time inside the kiln, it became important to make as many tests of this material as possible and to keep detailed records of results. As the complicated process described above suggests, one of the most important aspects of producing high-quality colour glazed tiles involves the engagement of sufficiently qualified and experienced craftsmen. While glazed tiles are produced in Balkh, mainly in the context of on-going restoration of the Ali Shine in Mazar-e Sharif, the quality and design of these tiles remains poor. Following the identification of local craftsmen with some experience in producing tiles, the main objective became to focus on the transfer of knowledge from senior project personnel with previous experience in producing glazed tiles. Based on information gathered from comparative analysis of historic tiles, detailed research on

regional methods of production, multiple on-site tests of materials and glazes, and lastly by trial and error, craftsmen were able to consistently produce high-quality glazed tiles for use in the consolidation works. In addition to producing relatively simple 5cm x 10cm single colour tiles used in the retiling of the dome, craftsmen were able to produce highly complicated large three-dimensional tiles used in the *Muqarnas* area and "haft-rangi" tiles for consolidation works within the Mosque.

(f/g) Retiling of the Dome & the '*Muqarnas*' and the application of new tiles using innovative techniques:

Ribbed Dome

Durable colour glazed tiles were applied to the dome, originally in the 16th century, in order to embellish the important religious structure and to protect the baked brick masonry sub-structure from water penetration and weathering. A large percentage of the tiles that remained on the dome were produced during several inadequate restoration attempts in the late 1970's and in early 2006. A vast majority of these were damaged and had become substantially loosened or had been detached from the dome. The base material (clay), the shape and design of the tiles, the chemical composition of glazes, the baking process and the installation techniques and mortar composition were found to be below acceptable standards. As a result, the penetration of water and ice had damaged the external glazed surface of the tile and forced the tiles to "pop" off the structure during extreme temperature fluctuations.

In total approximately 78,800 (400m^2) of damaged tiles were carefully removed from the Dome. Previous retiling had made use of historic tiles together with new tiles that had been produced at that time. These tiles were sorted and original tiles in good condition were preserved. In total more than 35,000 historic tiles were salvaged and reused in the retiling of the dome. The process of preparing approximately 44,000

new single glazed turquoise tiles (see previous section) at a size of 5cm x 10 cm, required more than 10 months of production.

The production of new glazed tiles for the dome presented an opportunity to improve upon the shape and design of the backing of the pieces in order to ensure better adhesion (grip) with the plaster mortar used to apply the tiles to the dome. The fact that most of the previous tiles had become loosened or detached made this work especially important. Provisions included the design of perforations in the body of the unglazed area of the tile, which allowed the tiles to be “stitched” together inside the formwork using glass fiber strings. Similar holes needed to be drilled into more than 35,000 older original tiles using a drill stand.

The complex geometry of the Dome required the design and construction of precise reinforced plaster forms that mimicked the exact shape and geometry of the 12 meter long double-curved masonry ribs. The masonry dome beneath the tiles had been reconstructed and repaired several times in the past century, resulting in an uneven and irregular surface. This made the design of a single formwork that could be replicated precisely across the circumference of the entire dome a major challenge.

In order to respond to this limitation, the shape of the formwork was based on a design that could resolve the geometry of most irregular and convoluted section of the dome. These forms were built in 16 sections with different circumferences and laid out over a large area so that glazed tiles could be applied.

Teams of masons began to construct large sections of the tile work inside the forms on the ground. During the process of laying out the tiles in the formwork, masons used glass fiber mesh to “stitch” the tiles together – increasing their strength – and applied silicon adhesive on the external edge of the tiles in order to allow for expansion and contraction during large fluctuations in temperature. The backs of the assembled tiles were reinforced with a glass-fiber mesh encased in the plaster mortar. Adjoining sections of tiles were staggered so as to allow the interlocking of tiles when assembled.

Once cast, large sections of the formed tiles were lifted in place above the masonry ribs covering the dome. Teams of masonry worked to fit the sections of tiles before pouring composite plaster grout that included sand and brick powder. In sequence, the largest and lowermost sections of the tiles were placed first and then subsequent smaller sections were installed until the tiled rib had been completed. This process was repeated on the construction of 56 tiled ribs. Once all the ribs had been installed, tiles were installed over a small circular area at the top of the dome topped with a 1.6 meter high copper coping structure that had been built in the 1970’s.

‘Muqarnas’ tiling

One of the most unique features of Islamic architecture, the *‘Muqarnas’* is the name given to a section of complex decoration that elegantly resolves the convergence of multiple geometries. Often used above columns, domes, and niches, the two surviving sections of the *muqarnas* in the Khwaja Parsa shrine are immediately below the ribbed dome, above the cylindrical drum base, and inside the main mosque above the *mihrab* or prayer niche. However the most elaborate *muqarnas* are associated with domes.

There were 56 sections of original *muqarnas* decoration at the lowest point of the tiled rib dome made from complicated mosaic tile work. At the time of commencing conservation works, 31 of the original *muqarnas* had survived in varying states of disrepair, with a further 7 rebuilt during the last attempted conservation in 1975, and the remaining 18 sections had been simply plastered with gypsum. As part of the restoration and consolidation project, AKTC undertook to repair the 31 original sections of the original surviving *muqarnas* by recycling small pieces of mosaic decoration and meticulously reinstalling these pieces by hand. Additional work was required to produce 18 sections of new three-dimensional glazed tiles in order to consolidate the destroyed areas of the *muqarnas*. This was done using clearly distinguishable tiles with simplified colour patterns, as required by standard conservation practice. Loose or damaged sections of the muqarnas reconstructed in 1975 were consolidated.

Based on a survey of the historic *muqarnas,* tile workers copied the original designs and prepared accurate formwork for the production of new sections of the decoration.

These forms were then used to produce several sections of three-dimensional unbaked tiles which were assembled and tested for compatibility with the original *muqarnas* design. Samples of the new decoration were also installed in situ beneath the dome in order to test installation methods and for the purpose of making architectural comparisons of the suitability of the design. Once teams had perfected the process of producing new sections of *muqarnas* tiles and had finalized colours and glazing finishes, the individual tiles were installed in place above the drum. Together with the retiling of the dome and the repair of the original *muqarnas*, the construction and installation of new sections of the decoration will ensure that the historic structure is protected from water and ice damage in the future.

3.6 Iwan portal, Minarets, and Drum: Structural consolidation and conservation of Glazed Tiles

(This section of the report outlines in detail activities carried out under this Grant and under a separate addendum to the Khwaja Parsa project - ref: "Repair and Conservation of Glazed Tiles – Khwaja Parsa Shrine, Balkh")

The *iwan* portal and minarets, believed to be a 16th century grandiose addition to an otherwise simple mausoleum, remain the most iconic and architecturally visible element of the structure. A detailed assessment has revealed the formation of large cracks affecting the structural integrity of the main *Iwan* arch and Minarets as listed:

- Two substantial vertical cracks running down the elevation on both the north and south sides of the *Iwan*.
- Another horizontal crack on the front of the *Iwan* both inside the portal and above the uppermost arch on the outside of the portal.
- Other significant vertical cracks exist on the inside of the Minarets - in the stairwell walls at the same level as the top of the *Iwan* arch, stretching for approximately 1m vertically and as wide as 60mm to 80mm.

The orientation of cracks at the front of the portal indicates that the main *iwan* or portal is moving and may also be partially detaching from the front of the mausoleum. This has also affected the structural stability of the two adjacent minarets, which are settling to the north and south away from their original vertical position.

This movement is a result of severe settlement problems identified earlier in this report. The construction of the north and south wings of the mosque have made a significant contribution towards resolving the settlement problem by providing structural buttresses on either end of the Shrine and in the direction of the movement. The removal of concrete surfaces surrounding the building and the repaving of this area with brick has reduced water-logging problems and the build-up of moisture that had previously led to the softening of the earth beneath the building and eventual settlement.

In addition to preventing further settlement, structural consolidation and strengthening work needed to be carried out on the Iwan and Minaret in order to address large cracks in the masonry caused by settlement that had occurred earlier. In consultation with the Department of Historic Monuments and technical advisors, it was decided to undertake key measures aimed at safeguarding the both structures including; **(a)** ***establishment of key monitoring points*** in order to assess active movements in the structure, **(b)** ***preparation of designs*** for stabilization measures, **(c)** ***implementation of structural consolidation*** plans, **(d)** ***repair and consolidation of historic tiles***, **(e)** ***production and application of new tiles, (f) repaving*** *of the areas immediately surrounding the Shrine and Mosque,* ***(g) restoration of the grave platform*** *directly opposite the Shrine,* ***(h) cleaning and restoration of painted external decoration.***

(a) Establishment of key monitoring points

For the purposes of monitoring movements including settlement horizontal shifts in the structure of the Shrine, calibrated engineering and monitoring instruments that met international standards were used and data collected over the course of one year was plotted on a monthly basis. Analysis of this data provided designers with detailed information on the scope and type of structural intervention required in order to ensure the long-term structural stability of the *Iwan* portal and adjacent Minarets.

(b/c) Preparation of designs & implementation of structural consolidation

While movement was detected in the vertical cracks in both the *Iwan* and in the staircase area of the minarets at the beginning of conservation works, continued monitoring of active structural breaks following the reconstruction of the historic and new mosque wings indicated that the lateral movement became insignificant. This information indicated that the conservation team's objective of using the new wings of the mosque as buttresses against lateral forces in the *Iwan* and minarets functioned accordingly.

The final step of completing the structural consolidation of the this area entailed "stitching" of the vertical cracks with baked bricks and the insertion of steel rods and ties into the brick masonry in order to prevent future damage in these weakened areas in the advent of earthquakes. Based on designs prepared by a qualified structural engineer, the measures included; (1) using steel "tie-rods" to link the internal staircases of the two minarets through the main load bearing "back wall" of the *iwan*, and (2) using galvanized steel "tie-rods" to link the main "back wall" and the "front wall" of the *iwan* together.

Measures were carried out by drilling holes up to a depth of 100 centimeters in key intersections between the stairwell of the minarets and the vertical load bearing walls of the *Iwan*. Additional cuts were made along the length of the walls and two parallel "ties" were designed using U-channel steel profiles. These "ties" were joined by threaded 33mm / 16mm steel rods that were fastened in place using base-plates, washers and bolts. Base plated exposed to the elements were made of stainless steel so as to avoid rusting.

(d) Repair and consolidation of historic tiles

(This section of the report outlines in detail activities carried out under this Grant and under a separate addendum to the Khwaja Parsa project - ref: "Repair and Conservation of Glazed Tiles – Khwaja Parsa Shrine, Balkh")

Iwan portal: The main Iwan portal is composed of several individual sections of design incorporating varying styles of colour glazed tiled decoration. The main external facing elevation and the cork-screw tiled columns are exposed to direct weathering and have suffered the most damage in recent years. The internal covered wall together with the arched sofit have been spared exposure to rain and ice, but large sections of tiled decoration in these areas have become detached from the masonry walls due to the penetration of water from areas above the Iwan structure. Due to raising damp at the base of the Iwan, a vertical band of 1-meter high original tile-work located directly above ground level had collapsed and been replaced with modern tiles during the construction works in 1975. Luckily, large areas of the original tiled decoration, including sections of Kufic inscriptions and mosaic tile-work on the

cork-screw columns had survived centuries of neglect and weathering. As the main entrance and one of the most visible features of the mosque, conservation activities were expanded to include consolidation and repair of the tiled decoration under an addendum to the existing grant. The first order of work involved the removal of newly produced tiles (1975) at the base of the Iwan area and the repair of the damp and eroded masonry walls on which the tiles had been installed. Damaged brick was removed and replaced with new masonry using lime mortar, followed by the reinstallation of the glazed tiles. In order to prevent raising damp in the future, the thick concrete flooring inside the Iwan area was removed and the level of the ground was lowered by 40 centimeters. It is expected that the removal of the concrete flooring and re-paving this area with baked bricks on edge will reduce the build-up of damp beneath the Iwan area.

All of the tiled decoration inside the Iwan portal, above the level of the base band, remains the original historic tile-work. Repair works on the perpendicular walls that extend upwards to join the arched sofit, which include sections of kufic inscriptions, involved the careful consolidation of areas of the decoration that had become detached from the masonry structure. In areas where the deformation (detachment) of the tiles were limited, hand operated jacks were used to stabilized the decoration and gypsum grout was poured to re-attach the tiles to the masonry walls. Where the deformation was significant, these sections of original tiles were carefully removed and reinstalled using traditional materials and techniques. A similar process was repeated carefully in all areas inside the *Iwan* where the original tile-work had become detached. Once sections of detached the original tiles inside the *Iwan* portal had been consolidated, the remaining surfaces were cleaned and re-pointed with gypsum plaster. The original mosaic tile-work found on the cork-screw columns were repaired and consolidated, as per the techniques described above.

The section titled (e) Production and application of new tiles (glazed and unglazed) expands further upon the consolidation activities undertaken in areas including beneath the sofit of the arch of the main Iwan and the cork-screw columns, where the original tiles had fallen off and the cavities had been simply plastered over during previous construction works.

Minarets & Drum: Exposed permanently to the elements and with large sections of the upper areas of the minaret having collapsed before the 20th century, project activities involved; (1) consolidation of large cavities in areas of the masonry structure used to apply colour tiles, (2) repair of areas of the original tile-work that had become detached, and (3) pointing of all surfaces of tiled decoration. In total more than 990 square meters of original glazed tiles were repaired, consolidated, and re-pointed in the Iwan (360m2) , minarets (200m2) , and drum (219m2) areas.

(e) Production and application of new tiles (glazed and unglazed)

(This section of the report outlines in detail activities carried out under this Grant and under a separate addendum to the Khwaja Parsa project - ref: "Repair and Conservation of Glazed Tiles – Khwaja Parsa Shrine, Balkh")

Iwan, Minarets, & Drum

In order to permanently protect large areas of the tiled decoration on the main Iwan, minarets, and drum surface, it became necessary to produce new colour glazed and unglazed tiles. This required the production of simplified designs based on the original decoration in those areas. These tiles were used to "frame" large areas where the original tiles had collapsed or to produce distinguishable designs for areas where it became necessary to tile large surfaces in order to protect adjacent sections of original tile-work.

Framing tiles were produced and used to protect sections of the decoration where the penetration of water would eventually lead to the collapse of original tile-work. New unglazed tiles were also produced and used in covered areas where direct

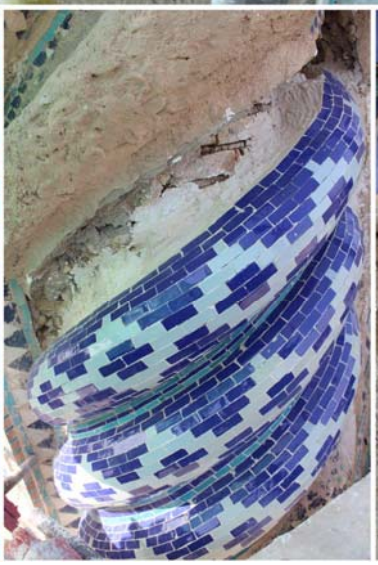
exposure to the elements was limited. These tiles were installed in a manner that would subtly continue and reflect the design of the original tile-work while allowing the new tiles to be clearly distinguishable from the historic decoration.

The installation of the new tiles included large areas under the sofit of the arch of the main Iwan, where subtle difference in the surfaces of the tiles resulted in the

repetition of the designs of the original tile-work and in sections of the cork-screw columns, where color tiles provided an abstract and simplified reflection of the original mosaic tile decoration.

Drum (20m2 new glazed tiles / 20m2 new unglazed tiles / 34m2 gypsum plaster) Minarets (7m2 new glazed tiles / 6m2 new unglazed tiles / 7m2 gypsum plaster) Iwan (37 new glazed tiles / 60m2 new unglazed tiles / 30 m2 gypsum plaster)

In total more than 64 square meters of new glazed tiles and 86 square meters of unglazed tiles were produced and installed.



(f) Repaving of the areas immediately surrounding the Shrine and Mosque

Information provided earlier in this report outlined details of the detrimental effects of the external concrete paving that had been laid around the Shrine and Mosque at an inappropriate height of more than 50 centimeters above the internal level of the flooring. In additional to causing severe water-logging problems and rising damp beneath the Mosque, the lack of appropriate falls in the concrete paving and insufficient drainage meant that rain water and snow melt generally collected in large puddles outside the building.

In order to restore the original levels of the external areas immediately surrounding the Mosque and ensure the appropriate diversion of water away from the building, new on edge brick paving was laid on the eastern perimeter of the Mosque. Standard slopes for the diversion of water away from the building were built into the baked brick paving; culmination in the construction of a perimeter drain that ensured rainwater could be contained and directed into larger drains in the garden. The use of baked bricks on edge ensured that the paved area, which is often used for prayer and gatherings during religious events, could continue to provide a durable functional space for the community. The use of baked bricks, which allows the slow evaporation of damp soil also helped reduce the water logging problems around the building.

In total more than 5900 square meters of brick paving was laid and 62 linear meters of surface and underground drains constructed.

(g) Restoration of the grave platform directly opposite the Shrine

It is believed that Khwaja Abu-Nasr Parsa is buried within the platform located directly opposite the main Iwan of the Mosque. While the original grave of the sufi mystic may have been much simpler, over time the platform was expanded to include additional graves belonging to his sons and other distinguished persons. The grave of Mir Mazeed Argun is also located within this platform and is noteworthy because he commissioned the installation of all the coloured glazed tile-work on the otherwise simple Shrine.

The platform had been repaired on several occasions, the most recent of which had included the addition of layers of concrete surfaces. In order to restore the platform using appropriate materials that match the technical and visual requirements of the project, skilled teams of mason's carefully removed sections of the recent intervention and encased the platform in a new baked brick masonry wall.

(h) Cleaning and restoration of painted external decoration

(This section of the report outlines in detail activities carried out under this Grant and under a separate addendum to the Khwaja Parsa project - ref: "Repair and Conservation of Glazed Tiles – Khwaja Parsa Shrine, Balkh")

While there is debate on the originals of the painted decoration within the external niches located in the upper areas of the main Iwan, the decoration presents another

aspect of important embellishments of the shrine. In order to preserve these areas of decoration, the hand painted floral motif was carefully cleaned and fixed with a primal solution. Adjacent sections of deteriorating plaster work were also repaired. Recent graffiti added to the walls was removed using special solvents and by scraped with steel utensils.

As appropriate and in areas where the addition of painted decoration reflected and reinforced the original designs, teams of painters revived previous floral patterns using water based paints.

In total more than 65 square meters of hand painted decoration was cleaned and restored, which included 27 square meters of newly painted areas.

3.7 Historic Mosque: Cleaning and restoration of "*moaraq*" mosaic tiles, painted floral decoration, and other internal conservation works.

(This section of the report outlines in detail activities carried out under this Grant and under a separate addendum to the Khwaja Parsa project - ref: "Repair and Conservation of Glazed Tiles – Khwaja Parsa Shrine, Balkh")

The internal decoration of the historic mosque consists of a floral pattern composed with a band of "*moaraq*" or mosaic glazed tiles at the base of the walls, culminating within a larger section of tiles, including glazed *muqarnas* sections above the *mihrab* (prayer niche) on the western wall of the mosque, on direct axis to the entrance into the building. Constituting the most important and significant remains of historic tiled decoration on any monument in Balkh, priority was given to the cleaning, consolidation, and selective retiling of this area in order to protect the internal

decoration of the mosque. Work on the conservation of this area only commenced when other major structural interventions had been completed and once project personnel had mastered techniques to produce glazed tiles using traditional techniques and materials and included; **(a)** ***careful cleaning of historic tiles*** *that had been painted,* **(b)** ***repair and consolidation*** *of weaken sections of tile-work,* **(c)** ***production of "haft rangi" (seven colored) tiles and installation*** *in areas of the tile work that had previously collapsed,* **(d)** ***cleaning and consolidation of hand painted decoration (e) repair of plaster*** *in selective areas of the mosque.*

(a) Cleaning of historic tiles

The design and production of *Moaraq* or Mosiac tiles requires the highest level of skill and creativity that a master tile maker can hope to achieve and the sections of this type of tile-work that remain within the Khwaja Parsa Shrine are the work of a master in the craft. After more than 4 Century's of wear and tear and the turbulent period of recent conflict in Balkh, it is surprising that large sections of this type of tiled decoration survived the neglect of maintenance and repair. The main reason for the survival of the tile decoration must thus be associated with the fact that the tiles are located within a place of worship and prayer.

Following documentation and study of the internal spaces of the mosque it was discovered that large areas of the decoration lay hidden under layers of plastic and water-based paint, probably commissioned through *Waqfs* (religious donations) made over the past 3 decades. The initial task of the conservation team was thus to carefully remove the paint, exposing and consolidating the mosaic tiles beneath. Special tools for the removal of the paint were produced in order to avoid scratching the surface of the glazed tiles. Chemical paint removers could not be used as they may have caused damage to the tiles or resulted in the discoloration of the plastered

mortar joints. It remained for teams of worker to painstakingly remove the paint by hand with no more than 30 centimeters square possible per day per person. Once the complete length of internal elevation of the mosque had been cleaned, it possible to take stock of the full design of the mosaic tile decoration. While large sections of the decoration had been removed or had collapsed and replaced with simple plaster and hand painted motifs, the areas of the mosaic decoration that survived constitutes one of the most important and significant remains of such craftsmanship in Balkh. In total more than 93 square meters of original tile work were cleaned.

(b) Repair and consolidation of weaken sections of tile-work,

Following the cleaning of the mosaic tiles, the next task involved the repair of large sections of the historic tile work that had been damaged and the consolidation of areas that had become weakened or detached from the walls. This was done by carefully stabilizing the tile work in place and injecting a special plaster based mortar into the gaps and cracks behind the tiles. Once the mortar composite had dried, a layer of plaster was applied to the surface of the tiles in order to fill the gaps that had appeared between the mosaic. The surface of the tiles where then cleaned with warm water and cotton cloths and left to dry. With the full length of the historic mosaics tiles consolidated and repaired, the next task involved the retiling of sections of the decoration that had collapse or been removed. In total more than 90 square meters of original tile work was repaired and consolidated.

(c) Production of “haft rangi” (seven colored) tiles and installation

Several areas of the decoration where the mosaic tiles were missing were simply filled with plaster and crudely repainted by hand. In consultation with counterparts and as per standard conservation practice, it was decided that new *haft rangi* tiles would be produced as per the designs of the mosaic tiles and installed in areas where the original decoration was missing. The purpose of this work was to protect the remaining historic tiles while retaining the overall cohesion of the space and decoration. The *haft rangi* tiles are typically used in conservation where mosaic tiles are too difficult to replicate or require significant time to produce. These tiles are usually made in standard sizes – often rectangular or square – and the decorative

pattern required is painted on by hand and in multiple colours. In the context of the Khawaja Parsa mosque, craftsmen designed a standard 10cm x 10cm square tile upon which the historic floral pattern of the mosaic tiles were drawn and painted in similar colours. As part of standard conservation practice, new areas of tiled *haft rangi* decoration are distinct and distinguishable from original sections of the mosaic decoration yet contribute to the overall harmony of the space and effect of continuity. In this instance the areas retiled also protect and safeguard the mosaic tiles against deterioration and help prevent inappropriate interventions in the future by unskilled laborers.

In total more than 1.3 square meters of new *'haft range'* tile work was produced and installed.

(d) Cleaning and consolidation of hand painted decoration

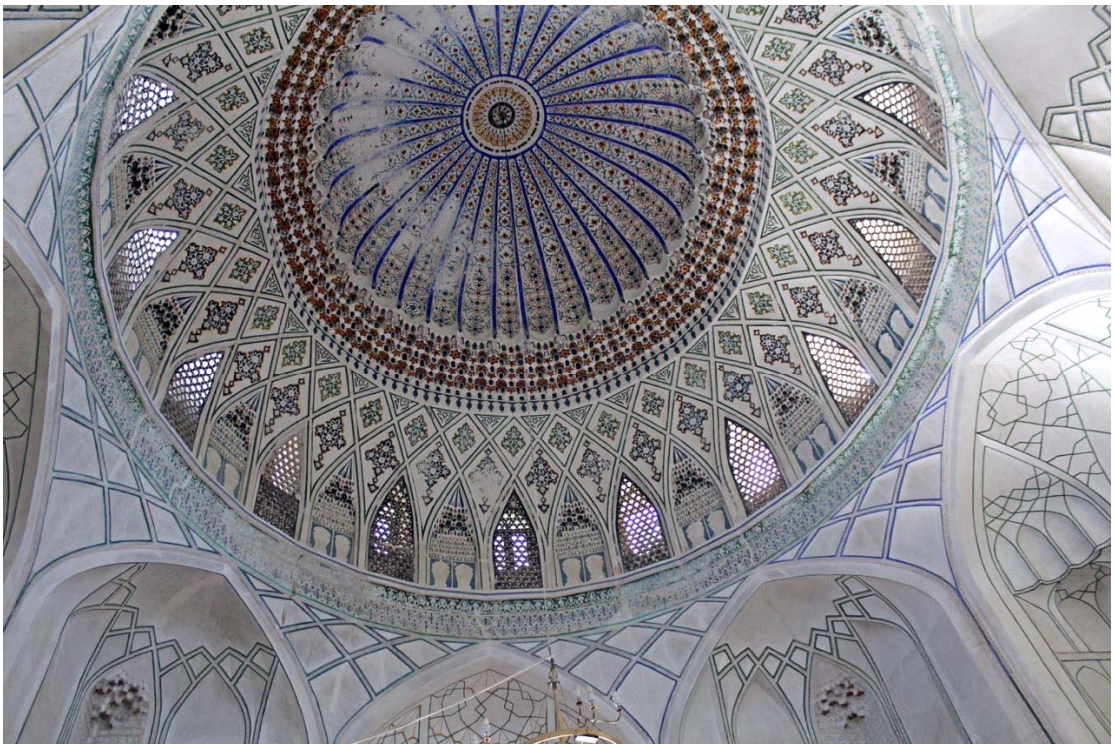
Immediately above the 1.8 - meter high band of mosaic tiles, the internal walls of the mosque are covered with hand painted floral decorations extending more than 17 meters vertically and covering the internal plastered surface of the dome above the space. The build-up of dust and slow fading of the painted decoration made it difficult to distinguish the designs in the upper areas of the mosque. Following the construction of a scaffold structure that reached areas beneath the dome, skilled labourers undertook the meticulous work of cleaning and revealing the full scope of the painted decoration. While it was decided that none of the sections of the painted decoration would be repainted or otherwise embellished, the cleaning of accumulated dust and dirt from the surface of the walls had the immediate effect of visually reviving the painted surfaces. Once cleaned, the painted decoration was fixed in place and consolidated using a Primal solution, which is an accepted material used widely in conservation to protect wall paintings and murals. The solution was applied by hand with a fine tipped brush and left to dry.

In total more than 410 square meters of painted decoration was cleaned and conserved.

(e) Repair of plaster

Damp that had penetrated the cavities between the historic mosque and the flanking concrete mosques had resulted in the sustained penetration of snow melt and rainwater into the upper areas of the historic masonry structure. Together with water saturation in the brick surface above the mosque, resulting from inappropriate falls in the paving, the seepage of moisture into the building had resulted in the slow deterioration of sections of the internal plaster finish. These areas of loose and damaged plaster were carefully removed, left to dry, and re-plastered using gypsum.

In total more than 18 square meters of gypsum was applied to the internal elevations of the mosque.



3.8 Provision of utilities and services for building

As part of the project, appropriate levels of external architectural lighting, internal functional lighting, and sockets and switches were installed in the new and historic mosque.

4 DEMOBILIZATION

AKTC projects are all undertaken with the aim of handing over all responsibility for sites' maintenance to local authorities. Restoration efforts focus on the sustainability of works undertaken, and must be maintained by the local community. As such, the team – in conjunction with the local community and its representatives – will further

develop its de-mobilization plan that outlines the management plan following the conclusion of restoration and stabilization activities.

5 PROJECT DATA & STATISTICS

- Total man/days of employment generated: 77,900
- Total man/days of skilled employment: 11,600
- Total man/days of unskilled employment: 66,300
- Total personnel trained as tile makers, masons, carpenters, and technicians: 45
- Total number of local architects, draftsmen and surveyors: 4
- Total number of support personnel employed in the project: 12

6 ANNEXES TO THIS REPORT:

1- AKTC Project Panels (Khaja Parsa Shrine)
2- Project Photographs
3- Project Drawings and Surveys