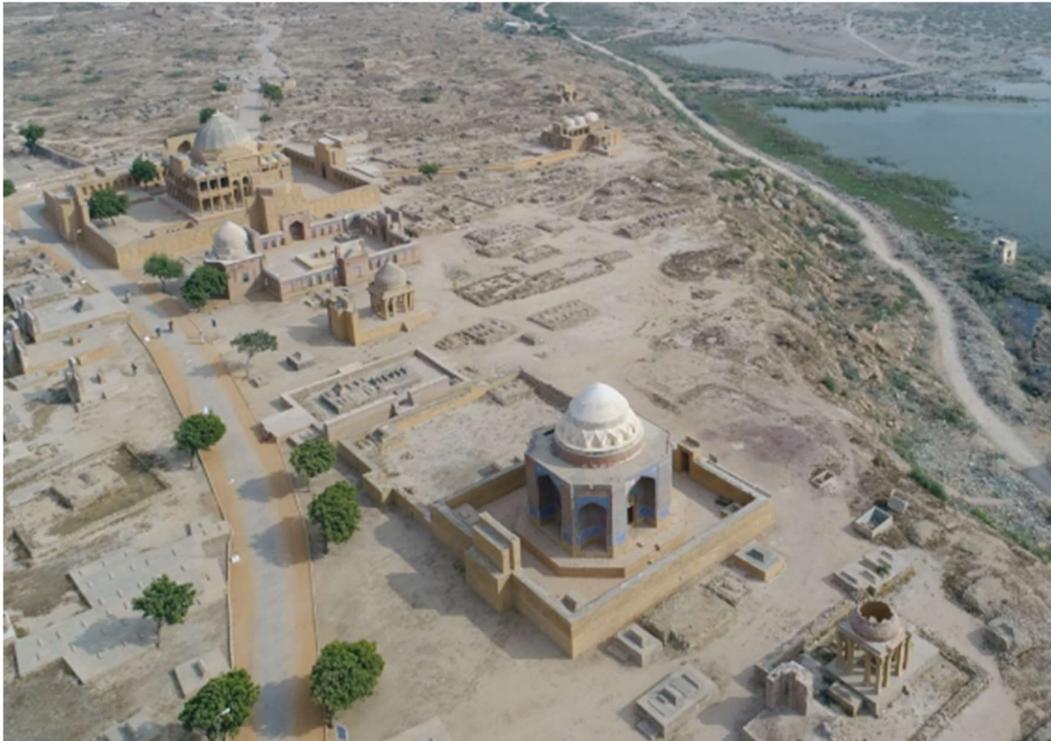




*Culture, Tourism & Antiquities Department
Government of Sindh (Pakistan)*

**STATE OF CONSERVATION REPORT
HISTORICAL MONUMENTS AT MAKLI, THATTA (PAKISTAN) (C 143)
DECISION: 41 COM 7B.97**

*In compliance with Paragraph 169 of the Operational Guidelines
Following the format for the submission of SOC reports by the State Parties*



CULTURE, TOURISM AND ANTIQUITIES DEPARTMENT
GOVERNMENT OF SINDH

Contents

Executive Summary	4
Response to the Decision of the World Heritage Committee (41 Com 7B.97)	5
Other Current Conservation Issues	18
Major Restorations, Alterations and/or New Constructions	19
Public Access	20
Signature of Authority	21
Appendix	22
Data Analysis from the Weather Stations	22
Data Analysis from the Crack Monitors	26
Tomb of Jam Nizamuddin: Structural Assessment/Recommendations (Dr. Beckh) ...	31
Living Heritage Report	62
Desecration of Graves	67
Photographs and Captions	73
Individual Monuments, Photographs and Captions	93
List of Figures	111
Conservation Report Heritage Foundation Pakistan	113



*Culture, Tourism & Antiquities Department
Government of Sindh (Pakistan)*

November 28, 2018

We are proud of our recent accomplishments at Historical Monuments at Makli, Thatta. Protection of the Outstanding Universal Values has never been better. At risk significant monuments have been stabilized, others are being monitored, the site is more secure and clean with the removal of rubbish, wild vegetation, and graffiti, and numerous individual grave markers have been reassembled following a defined protocol of anastylosis. The site is also more peaceful for the thousands of visitors we host weekly. We have prohibited private cars, their horns, and random parking near ancient tombs. Visitors may still enter freely and their access to the large site is facilitated by three small sustainable electric buses. Illegal housing and business encroachments have been and are currently being removed following a resettlement program and for the first time in a generation many important tombs are visible. The boundary wall is also once again under construction, and the visitor's center and gift shop have been rehabilitated.

We are also striving to communicate the significance of Makli locally, regionally, and internationally. The Culture, Tourism and Antiquities Department recently hosted the First International Conference on Makli which was attended by international experts but more importantly by the local community. Academic papers were presented on the history, importance, and conservation of the site along with music, dance, and food. Over 7,000 people attended the three-day event.

We realize Makli has suffered for decades and have read the past decisions of the World Heritage Committee and the Reactive Monitoring Mission reports. But we firmly believe we have reversed this trend. The transfer of responsibilities for Makli to the Provincial Government of Sindh has had a positive outcome and impact on the site.

Of course, we must always be vigilant and there is much work that remains but we are up to the challenge. Therefore, we are proud to submit this State of Conservation report.

Sincerely,

(Manzoor Ahmed Kanasro)

Director General
Antiquities and Archaeology

Executive Summary

Response to the Decisions of the World Heritage Committee - Within this SOC report are in-depth responses to each decision. This comprises actions successfully completed as well as actions currently ongoing. Completed activities include: an inventory system for displaced architectural elements, installation of weather stations and crack monitors, drafting of the management plan, stabilization of components in danger of collapse, capacity building of the staff, baseline documentation in drawings and photographs, and the submission of this report. There have been numerous conservation efforts at Makli including Jamia Masjid, Essa Khan II, Mubarak Khan, Old Jamia Mosque, Sultan Qaus, Hamshera Fateh Khan, Mirza Tughral Baig, Juman Jatti, Sunjo Qubo, Jani Baig, Arghun Mosque, Meran Bai, Jan Baba, Dewan-E-Shurfa, etc. Actions currently underway also include a detailed structural assessment and recommendations of the tomb of Jam Nizamuddin. This tomb must be addressed with the utmost caution as it is a complex and delicate structure as well as a defining structure of Makli. Thus we have begun in-depth studies, research, and have solicited numerous proposals for the stabilization of this monument. This tomb, as well as others are undergoing continual monitoring with the decisions of the Committee and Reactive Monitoring Mission as guidance.

Other current conservation issues with possible impacts on OUV - There are several ongoing issues not previously addressed. These consist of the living aspects of Makli; that it is used by thousands of people, as pilgrims and the local community on a weekly basis and there are 21 active shrines on the site, each with its own “caretaker.” Therefore, a visitor plan and survey are being considered. Another issue is drainage and maintenance and the site team is actively working on a maintenance plan. Finally, a recent vandalism attack has occurred at the tomb of Jam Nizamuddin. While the perpetrator is in custody and the new security measures functioned, this event has been disappointing. A meeting of the Steering Committee was immediately convened and an independent consultant charged with investigating. Within the appendix of this report is our own assessment of the event.

Major restorations, alterations and new constructions - There have been numerous major conservation works at a number of significant tombs including Lali Mosque, Isa Khan Tarkhan II, and Jan Baba, Sultan Ibrahim, and recently begun works at Munir Maghfoori, including its decorative tiles (unknown before) by the Heritage Foundation. But there have also been numerous small restorations at less significant but still contributing historic tomb markers. As the site has been cleared of decades of vegetation these elements have been recovered. Alterations include the non-historic buildings on site: the refurbishment of the visitor center and gift shop, rehabilitation of the entry gates, and the structures that house the site office and residences, offices and documentation center. New construction includes key portions of the boundary wall, new gates and importantly, removal of commercial and residential encroachment on site.

Public access - In accordance with the policies of Government of Sindh and our current outreach efforts this report will be within the public domain. We are eager to share our recent accomplishments to protect Makli for future generations.

Appendix - Numerous additional documents are attached to this report to describe the state of conservation. These include the data analysis from the three installed weather stations, observation reports of the crack monitors installed at a number of monuments, structural report from an international expert engineer on Jam Nizamuddin and reports from the non-profit Heritage Foundation Pakistan, our partner on a number of conservation projects. This appendix also contains photographs.

Response to the Decision of the World Heritage Committee (41 Com 7B.97)

Decision: 41 COM 7B.97

The World Heritage Committee,

1. Having examined Document WHC/17/41.COM/7B,
2. Recalling Decision **40 COM 7B.44** adopted at its 40th session (Istanbul/UNESCO, 2016),
3. Expresses its appreciation for the significant efforts expended by the State Party to improve the state of conservation of the property by regularly removing litter, graffiti and vegetation from the property, hiring security guards, and documenting/ storing displaced original architectural elements;
4. Notes however that important requests made the Committee are yet to be addressed or fully implemented, including the completion of barrier wall, the encroachment of contemporary burials on the property, the stabilization of important monuments, and the finalization of the Management Plan;
5. Requests the State Party to:

Decisions/ Concerns of WHC	Response from Culture, Tourism & Antiquities Department, Government of Sindh
5 (a to c)	
<p><i>a) Submit, at its earliest convenience, details of the inventory system for displaced architectural elements and documentation on the remaining architectural surface decoration, and especially glazed tiles, which constitute an important part of the attributes of Outstanding Universal Value (OUV) of the property</i></p>	<p>An inventory system has been initiated from January 2017 for displaced architectural elements in addition to the documentation on the remaining architectural surface decoration, especially the glazed tiles, has been carried out at the selected monuments. The inventory and documentation is being carried out on an on-going basis. A `draft manual was developed on procedural steps in collecting and collating the displaced material, ensuring their proper documentation and storage. The technical assistance in this regard was especially requested from an international expert who also conducted the on-site training of the concerned staff. It is to report that the site staff have successfully developed and demonstrated the skill in carefully implementing the process- which is being consistently followed at the various glazed and non-glazed monuments. The inventory and documentation of the fallen-off material has been notably carried out at the tomb of (Mirza) Baqi Baig. It is being ensured that the inventory and documentation system follows the context and historic photographs (before movement)</p>

	<p>where possible and the photography of the decorative surface, numbering and storage is also ensured for future re-use in the conservation works at the respective sites. Similar methodology has been adopted in collection, collating and storing of the glazed material, so as to protect the attributes of Outstanding Universal Value (OUV) of the property.</p> <p>It should be noted that the documentation of the recently ‘re-discovered’ graves (which were previously hidden in the wild-growth) is also carried out- in addition to re-positioning (anastylosis) of the displaced stones.</p>
<p><i>b) Ensure that programmes to record and analyse data from weather stations and crack monitors are implemented and that the results contribute directly to the management and conservation of the property and its monuments</i></p>	<p>In continuation to our previous SOC report, this is to state that three weather stations have been installed at the site (one each at the three prominent clusters) as per the guidelines of WHC. The stations are helpful in collecting the data on wind direction and speed, rainfall, temperature, and humidity. The weather data from the stations is periodically collected and stored in the attached laptop for analysis. Currently, the department has the data from last 11 months (Dec 2017- Oct 2018). As the site staff was not acquainted to dealing with the data transfer, the department engaged the experts from the Pakistan Meteorological Department (PMD) for conducting training sessions for the site staff on the hardware and software usage of the weather stations. As the staff’s capacity is being built in analyzing the weather data at the site level, the department engaged the expertise of PMD for analyzing the weather data in collaboration with the site staff. This State of Conservation report includes the ‘<i>Weather data Analysis Report</i>’ carried out during the process. We are confident that the current analysis exercise and subsequent sessions with the staff will build the capacity of the site management in analyzing the weather data at the site.</p> <p>It should be noted that since January 2017, the department has ensured the installation of 15 crack monitors at 5 significant monuments at the site which include the mausoleums of Jam Nizamuddin, Deewan Shurfa Khan, Issa Khan Tarkahn-II, Mirza Jani Baig and Tughral Baig. Initially, as there were no changes recorded in monthly monitoring, it was decided by the department that the monitors data shall be taken on</p>

	<p>periodic basis. It is interesting to note that since January 2017 to this day, the crack monitors do not show any traces of movement. A detailed report from the crack-monitors is attached with this report.</p> <p>We take this opportunity to report that the damaged crack-monitors from the mausoleum of Jam Nizamuddin (in an untoward incident taken place in September 2018) were immediately replaced and that there was no evidence of movement or further openings of cracks from the previous data analysis carried out in July 2018.</p> <p>It should be noted that in the light of Dr. Matthias Beckh's detailed study of and recommendations for the mausoleum of Jam Nizamuddin, the department has procured the high-precision monitors. These will be installed during the second week of December, 2018. The installation plan includes the capacity building of the site management staff and their technical training on the hardware and software of the digital crack monitoring.</p>
<p><i>c) Finalize the Management Plan for the property, taking into account the findings and recommendations of the 2016 Reactive Monitoring mission, together with a regulatory plan for the buffer zone of the necropolis, in consultation with the World Heritage Centre and the Advisory Bodies</i></p>	<p>The Master Plan prepared and finalized by the Department has certain elements of the Management Plan. However, a more concise and targeted Management Plan is needed, for which the Directorate of Antiquities and Archaeology is progressing to complete a draft for the RMM in January 2019. The Department is planning to submit an update to this 'State of Conservation Report' after the RMM- which will contain the Management Plan as well as the regulatory plan for the buffer zone.</p>

6. Urges State Party to:

<p>6 (a to f)</p>	
<p><i>a) Continue the stabilization of all elements in danger of collapse, in order of priority, particularly the Jamia Masjid and the Jam Nizamuddin</i></p>	<p>The department is in process, in order of priority, in continuing the stabilization of all elements in danger of collapse, particularly the Jamia Masjid and the Jam Nizamuddin Mausoleum and several other monuments groups, and is in process of producing the necessary preliminary assessments</p>

Mausoleum and several other monuments groups, and produce the necessary preliminary assessments and studies, as requested by Decision 40 COM.7B.44

and studies, as urged. One such major preliminary assessment and study has been conducted and produced regarding the stabilization of the mausoleum of Jam Nizamuddin conducted by the department (through the partial assistance from UNESCO) by engaging the Structural Engineer from Munich, Germany (Dr. Matthias Beckh). It is noted and conveyed that the study proved very helpful to the department, as it helped us in ‘not considering’ (through Steering Committee) the proposal received from the Endowment Fund Trust (EFT) for stabilizing the J.N mausoleum which did not carry out the holistic assessment of the monument. As highlighted above, the department is in process of installing the high-precision monitors at the J.N mausoleum and also in process of consulting a firm for carrying out the geo-scanning of the mausoleum. These two steps are essential for developing a holistic conservation plan in the light of the findings.

It is reported that the conservation/ stabilization work on Jamia Masjid was carried out by the department in 2017 to the satisfaction of the experts. We are looking further if there are any additional recommendations. Furthermore, it shall be noted that the stabilization efforts have been completed at 30 monuments at the site, which include the interventions ranging from the emergency to routine conservation steps.

It should be noted that the department has taken decision to support the Heritage Foundation for continuing the follow-on activities for sustaining UNESCO/WHC- Republic of Korea Fund-in-Trust initiative for continuing the ‘Community Involvement’ component in addition to support the Foundation for their new initiatives through Prince Claus Fund in conserving ‘glazed tiles’ of an unknown tomb and at ‘Satcharni’. It is appreciative to the department that ‘the so-called’ “Unknown Tomb” turned out to be the tomb of

	<p>Munir Maghfoori of which we did not have the prior knowledge.</p> <p>It shall be noted that the department in close collaboration and support of UNESCO Islamabad carried out a detailed Disaster Risk Reduction study at various places of the site. The study has been helpful in assessing the condition assessment of various monuments including the disaster risks and the natural and man-made threats to the site. It should be noted that the department has also approved the conservation of Deewan Shurfa Khan mausoleum through the support of the Endowment Fund Trust for conserving the glazed tiles of the monument, including conserving its elements at risk.</p>
<p><i>b) Determine the most appropriate way of accommodating new burials, notably by considering the allocation of an area outside of the property's boundaries to this use, set up a mechanism for civilians to obtain burial authorization, and ensure that the Management Plan acknowledges and addresses the living heritage values of the property and institutionalizes consultation with local communities</i></p>	<p>In the light of the recommendation, the department has taken strict measures in discouraging the new burials, which includes the tough resistance to high-personality burials at the necropolis. (It should be noted that a high political and social personality was to be buried at the Samma Cluster of the necropolis recently- the department took a tough stance against it- and stopped the burial from taking place). We have a similar stand against all contemporary burials, which we are discouraging at all occasions. But, it happens that until the barrier wall is completed (and until the communities are living for access) we are continuing to face some sporadic burials. However, we are confident, that with our community outreach efforts, we will be able to implement a zero new-burial at the site. Evacuation of all encroaching communities through a respectable time and alternative arrangements will also be helpful in completely stopping even the random burials.</p> <p>It shall be noted that the department has approached the highest levels of Government of Sindh and has finally issued a 'Notification of Ban' on new burials and free movement inside the site. 'Zero-carbon movement' and 'No new burial'</p>

	<p>remains the department’s top priority and we are continuing to follow it up.</p> <p>The department is convinced, that there should not be any ‘burial authorization’ within the site. It could be only considered if the intended parties are willing to bury at the ‘allocated zone’ at the buffer.</p> <p>It should be noted that the department is cognizant of and respects the living heritage of the site. About 21 living shrines have been identified where people from all over the country come and pay their respects. It is being ensured that all gatherings at the active shrines shall comply to the department’s rules and regulations for maintaining the respect and integrity of the site. We are in process that all caretakers of such shrines shall abide by informing the department of the important dates of their gatherings through written applications for approval especially when the shrines involve large gatherings. The applications shall be evaluated on the case to case basis and shall be granted or disallowed keeping in view the applicants’ track record of the compliance to the department’s regulations.</p>
<p><i>c) Consult with local communities regarding new burial arrangements and residential relocation and seek to incorporate programmes for education and outreach, making sure that changes do not create further risks of vandalism or damage</i></p>	<p>The department has recently initiated consultations with the local communities and it has been witnessed that many of them are in agreement with the department that there should not be any new burials at the site. We are in process of taking up the community outreach initiative through our local heritage community and by involving local academia, civil society activists and local media.</p> <p>As highlighted above, the department is considering the residential relocation of the encroaching communities and is taking up the matter at the district level as well as the provincial authorities. Department of Culture believes that no family should be displaced without the</p>

	<p>relocation arrangements. We are ensuring to incorporate programmes and outreach within our resources and through the local authorities as well as through the local heritage committee to make sure that the surrounding communities and potential outsiders (from Thatta or from Karachi) shall own and do not cause any further risks of vandalism or damage to the site and its integrity.</p> <p>It shall be noted that while encouraging the cultural and spiritual elements to the site, the department is also in process of continuing the sensitization and educational initiatives for the shrine custodians so as to ensure the site's integrity is respected and maintained at all levels.</p>
<p><i>d) Establish clear standards and mechanisms for the continued supervision of all interventions carried out at the property, whether by the Sindh Government's staff or by third parties, ensure that all regulations are followed and that proposals for works are submitted, reviewed, and approved before any work is undertaken on site</i></p>	<p>The department has established clear standards and mechanisms for the continued supervision of all interventions, its own or by third parties and is continuing to ensure that all regulations are followed according to established principles for weighing, reviewing and approving of all works proposed. In this regard, it may be noted that the department has constituted a 'Steering Committee' for the Historical Monuments at Makli, Thatta which is represented of the department's high officials, UNESCO Islamabad and the International Experts.</p> <p>It was through this 'Steering Committee' that the department has been able to review and assess various proposals from the 'Endowment Fund' and the 'Heritage Foundation' and could decide on their approval as per expert suggestions.</p>
<p><i>e) Develop a process for the prioritization of work and any related budgetary allocation to ensure that the most critical needs are met first. Priorities should be determined according to the significance and condition of the</i></p>	<p>The department is ensuring the priority of work and budgetary allocations to the monuments requiring the emergency and critical needs. Of all the 30 monuments selected for immediate intervention (which included Jamia Masjid and various other monuments informed to the RMM of 2016) were of in danger of collapsing.</p>

<p><i>monuments, such that the most significant monuments in the worst condition are treated before those of lesser significance and/or in a less degraded state of conservation</i></p>	<p>It may be noted that the delay in touching the mausoleum of Jam Nizamuddin was not due to department's lack of initiative but was in regard to its being the most delicate and significant monument requiring more studies.</p> <p>The department is planning, in the light of the recent study, to focus its resources on J.N mausoleum and will also ensure that all other monuments in need of emergency stabilization are also addressed. The department may require 'International Assistance' for J.N. mausoleum. A proposal to WHC in this regard is being considered.</p>
<p><i>f) For each monument, create an extensive baseline photographic documentation that can be used to monitor visible structural changes (e.g. loss of material, cracks, discoloration and biological growth). All photographs should include size and colour scales for reference</i></p>	<p>Extensive baseline photographic documentation at the site has been developed by the Heritage Foundation as well as through the historic photographs carried out by the Federal Antiquities and Archaeological department which are available to the department. It should be noted that we are also considering digitalization of the old and the historic photographs which will be made available at the site for ready reference.</p>

7. Encourages the State Party to:

<p><i>Provide short- and mid-term training programmes for the staff of the Department of Archaeology, to hire experts whenever necessary, and to develop a detailed list of responsibilities and a schedule of activities for each member of staff</i></p>	<p>The department is trying its best that the short- and mid-term training programmes for the staff of the Department of Archaeology- and to hire experts whenever necessary are ensured as and when necessary. From the previous SOC submitted to WHC in February 2017, it may be noted that that our key staff of Historical Monuments at Makli, Thatta has been engaged in 'Stone Conservation' training at Mexico and on the conservation of archaeological artifacts at EVEHA, Poitiers, France recently, in addition to their engagement at the 'Site Staff' engagement panel at the 42nd WHC meeting at Manama. It may be noted that the</p>
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	<p>department, since 2016, is consistently engaging the international experts of UNESCO from Spain and Germany. For each mission, a schedule of activities for each member of staff is being ensured.</p> <p>It may be noted that the many of the site staff (who did not have the opportunity of international exposure) had a remarkable exposure during the First Makli International Conference wherein the scholars and experts from across the region and the world came to participate.</p> <p>It should be noted that the department's key international expert, Mr. Rand Eppich is planned to carry out his capacity building and technical assistance mission to WH Makli from 7th to 14th December, 2018. The work plan includes the following activities;</p> <ul style="list-style-type: none"> (i) Installation of the digital crack monitors at the mausoleum of Jam Nizamuddin (ii) Technical training of the site staff on the hardware and software components of the digital crack monitoring (iii) Technical assistance/ engagement with 'Mapalytics' a company engaged by UNESCO Islamabad for carrying out 3-D scanning of the selected monuments at the site. It is being ensured that the copyrights of the exercise and end-product shall remain with the Culture Department so as to discourage the software's use for any commercial/ gaming purposes. It is also to ensure that the company shall closely engage the site staff for their capacity building.
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8. Also requests the State Party to

<p><i>Invite a joint World Heritage Centre/ICOMOS Reactive Monitoring mission to the</i></p>	<p>The Culture, Tourism and Antiquities Department has officially invited a joint World Heritage Centre/ICOMOS Reactive Monitoring mission to</p>
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<p><i>property in the first half of 2018, in order to:</i></p> <p>a) <i>Review the progress accomplished with the implementation of the decisions adopted by the Committee at its 40th and present sessions, as well as the recommendations made by the 2016 Reactive Monitoring mission, and in particular:</i></p> <p><i>the development of the Management Plan, the overall management of the property (e.g. litter collection, site security, contemporary burials encroachment), conservation works carried out on site, the mechanism established for physical interventions, including the prioritization of interventions, the establishment of documentation/inventory and monitoring systems;</i></p>	<p>the property in the month of January, 2019 for reviewing the progress accomplished upon the implementation of the decision adopted by the Committee at its 41 session at Krakow (Poland).</p> <p>It may be noted that the department was ready to invite the RMM in 2018, but it may be recalled that the UNESCO/WHC requested the department that the Mission’s schedule may be postponed until January 2019.</p>
<p>b) <i>Review the factors that constitute a threat to the property and consider whether there is still an ascertained or potential danger to the OUV of property,</i></p>	<p>The factors that did constitute a threat to the site are listed below with mitigation measures following the standard 14 primary threat categories required within a SOC report.</p> <p>Buildings and development – This was a threat to the OUV in the past due to commercial and residential encroachment. But this has largely been mitigated and is no longer a threat. This process is ongoing and some buildings remain but no new building is permitted.</p> <p>Transportation Infrastructure – this was also a threat to the site in the past with uncontrolled access by private</p>

cars and trucks. This has been stopped and the gates are kept locked. Three electric buses now permit visitors to visit the site as well as free access by pedestrians.

Utilities – electric lines do cross the site but are no threat to OUV.

Pollution – this is not a threat to OUV, although the overall air quality could be improved. The removal of the encroachments has helped in this regard.

Biological resources – not a threat to OUV.

Physical resource extraction – not a threat.

Local conditions and social cultural uses of the site.

This was a threat given open uncontrolled access to the site but this is more under control. There are numerous visitors to the site and a visitor plan is underway.

Other human activities – deliberate destruction of heritage. There has been a vandalism attack but the security measures functioned and this may be a single disturbance. The security of the site has been reinforced with the hiring of the additional guards.

Climate change, severe weather -There is a threat during the monsoon season given the heavy amount of rain and wind the site experiences. This and the geological conditions permit erosion at the slope below the site. This is currently being mitigated by active drainage measures and the maintenance of the ancient drainage channels.

Sudden events – not a threat

Invasive species – not a threat

Management and institutional factors – the management plan is underway and there is a new active management team in place. It has been determined that this is no longer a threat to the site.

<p>c) <i>Advise the State Party on the issues related to the boundaries and buffer zone of the property as well as the completion and implementation of the Management Plan;</i></p>	<p>In the past the western boundary and parts of the eastern boundary were very ill-defined. This allowed illegal settlements and illegal burials within the site. It also led to unauthorized commercial activities just outside the gates yet still on the property. The commercial activities have been removed and the main gate rebuilt toward the south of the site. The commercial activities within the village to the east of the site have also begun to be removed allowing tombs to be viewed for the first time in many years.</p> <p>The illegal settlements within the part were of two types, tents and more permanent structures. The inhabitants were advised they were required to move and they agreed. The tents were largely removed and the inhabitants of the more permanent constructions are currently being moved to other places.</p> <p>The ongoing construction of the boundary wall has and will continue to improve issues related to the boundaries. The buffer zones face similar issues and are being resolved although this is less of a concern than the encroachment within the site.</p>
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9. Further requests the State Party to:

<p><i>Submit to the World Heritage Centre, by 1 December 2018, an updated report on the state of conservation of the property and the implementation of the above, for examination by the World Heritage Committee at its 43rd session in 2019, with a view to considering, in the absence of substantial progress in the implementation of the above mentioned</i></p>	<p>Culture, Tourism and Antiquities Department, Government of Sindh, is, hereby, submitting the report within the given deadline.</p>
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issues, the possible inscription of the property on the List of World Heritage in Danger.

Other Current Conservation Issues

Living site

There are several ongoing issues not previously addressed. The first consists of the living aspects of Makli; that it is used by thousands of people, as pilgrims and the local community on a weekly basis to escape Thatta and Karachi. Visitors could number into the thousands on Thursday nights and, most likely, even higher during festivals. Visitation and use must be encouraged and facilitated while simultaneously reducing any impacts to the site. Visitors have a serious impact and the fragile monuments from their cars to well-worn paths that crisscross the site. Thus, proper visitor management is essential beginning with an education program. A visitor survey is being planned in cooperation with a local university and architect to understand how many visit, why, how they arrive, etc. A preliminary sample is provided in the appendix. In addition, a visitor plan will be drafted. Some elements have already been implemented given the urgency of the situation. This includes prohibiting private automobiles, the use of electric buses, limiting picnics (and the rubbish they produce), providing rubbish bins, and erecting some site didactics. There are 21 active shrines on the site, each with its own “caretaker.” The site management has reached out to these caretakers to educate and work together with them for the protection of Makli. This includes simple things such as encouraging them and having them encourage visitors to use the recently provided rubbish bins and to notifying site management when there is a problem. The program has largely been successful except in one case where legal action was taken to limit one caretaker’s physical alterations to a shrine. Reactive Monitoring Missions are typically too short to fully appreciate the impact of thousands of visitors per week and the numerous festivals that occur throughout the year. This must be brought to the attention of the World Heritage Committee.

Drainage and maintenance

Another issue is drainage and maintenance. The site team has addressed specific issues around key monuments but a comprehensive drainage and maintenance plan is being devised. The site team now have detailed topographic maps and have observed first-hand two monsoon seasons where the problems on the site occur. They have cleaned out ancient drains and this has improved the situation but there are still low lying areas within the site. They have met with experts and have begun to develop new paths for drainage that will not impact any important monuments. However this must be accompanied by a maintenance plan that outlines key dates and a schedule to inspect and clean drains and scuppers.

Security

Finally, a recent vandalism attack has occurred at Jam Nizamuddin. The perpetrator was caught and is in custody. While the new security measures put in place two years ago largely functioned, nevertheless, this event has been disturbing. A meeting of the Steering Committee was immediately convened and an independent consultant charged with investigating. The police report is also forthcoming. Within the appendix is the site teams report including photographs.

Major Restorations, Alterations and/or New Constructions

Restorations

There have been numerous major restorations at Makli in the last two years. These have been conducted by the Directorate of Antiquities as well as in cooperation with our partner the non-profit Heritage Foundation. These have been mentioned above in response to the decisions of the World Heritage Committee but are listed here in addition to restorations not previously included. However, this is only a summary as the reports, drawings, tests, and bills of quantity each monument are too detailed to be included here. However, they can be provided as needed and will be available to the next Reactive Monitoring Mission onsite at the Documentation Center. There have been numerous conservation efforts at Makli including Jamia Masjid, Essa Khan II, Mubarak Khan, Old Jamia Mosque, Sultan Qaus, Hamshera Fateh Khan, Mirza Tughral Baig, Juman Jatti, Sunjo Qubo, Jani Baig, Arghun Mosque, Meran Bai, Jan Baba, Dewan-E-Shurfa, etc. Actions currently underway also include a detailed structural assessment and recommendations of the tomb of Jam Nizamuddin. There have been numerous major conservation works at a number of significant tombs including Lali Mosque, Isa Khan Tarkhan II, and Jan Baba, Sultan Ibrahim, and recently begun works at Munir Maghfoori, including its decorative tiles (unknown before) by the Heritage Foundation Pakistan. But there have also been numerous small restorations at less significant but still contributing historic tomb markers. As the site has been cleared of decades of vegetation these elements have been recovered.

Alterations

Alterations, as opposed to conservation projects, are included in this section. These encompass, not modifications or additions to the historic structures, but changes to the supporting infrastructure and not historically significant structures. As per the previous section on restorations, there is simply too much information to be presented here; this is only a summary. Additional information is available in the office of the Directorate and at the Documentation Center at Makli. Such alterations include the refurbishment of the visitor's center at the entry, and the establishment of a gift shop at this center. included Graffiti and encroaching businesses were also removed at the main entry.

New Construction

There has been new construction in the form of a new entry gate, new barrier walls to the west of the site in accordance with the WHC decisions. There has also been demolition of some of the encroachment commercial and residential structures. New temporary structures were built at the side entry to the west for the Heritage Foundation offices and workshop as well as a new fresh water supply to the site offices and field house.

Public Access

In accordance with the policies of Government of Sindh and our current outreach efforts this report will be in the public domain. We are eager to share our recent accomplishments to protect Makli. Therefore, we welcome the efforts of the World Heritage Centre of UNESCO to place the contents of this report on the website as well as within the State of Conservation Information System database. <http://whc.unesco.org/en/soc>

The report will also be made available at Makli in our documentation center, a continually evolving, yet recently begun resource for scholars and visitors on site. The information will also be made available on the new website of the Government of Sindh, Department of Antiquities which you can find here: <https://antiquities.sindhculture.gov.pk/>

On this website you can find information about the Directorate General of Antiquities, the sites we are responsible for, activities at the site, 360-degree photographs, maps, publications and, most importantly, our conservation efforts.

We encourage you to visit.

We will also make this report, as well as others, available for the next Reactive Monitoring Mission team and will make every attempt to send what they require before arrival as we realize they have very limited time on site.

ACNOWLEDGMENTS

The Culture, Tourism and Antiquities Department, Government of Sindh, thanks the efforts of its team, Mr. Abdul Fatah Shaikh (Director Antiquities), Mr. Serfraz Nawaz Jatoi (Archaeological Conservator) and Mr. Nazeer Ahmed Zardari (Administrative Officer) for their continued efforts in protecting, preserving and safeguarding the site. Our appreciations to our Lead Consultants; Mr. Rand Eppich and Mr. Kazi Ayaz Mahessar for their continued engagement, dedication and technical assistance on the Historical Monuments at Makli, Thatta. The Department also thanks Ms. Yasmeen Lari (Heritage Foundation) for consistent initiatives in conserving and improving the site, more importantly in continuing to engage the local communities. We would also like to thank Mr. Nadeem Faisal and Mr. Asif Hussain from Pakistan Meteorological Department (PMD) for their technical assistance in carrying out data analysis from the weather stations.

Signature of Authority

UPDATED STATE OF CONSERVATION REPORT ON HISTORICAL MONUMENTS AT MAKLI, THATTA SINDH (PAKISTAN) (C 143) DECISION: 41COM 7B.97

State party	Culture, Tourism & Antiquities Department Government of Sindh, Pakistan
Name of Property	Historical Monuments at Makli, Thatta (Pakistan) (C 143)
Criteria under which the property is inscribed (iii) of the World heritage Convention.	“Bears a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared”

Signature of Authority

(Manzoor Ahmed Kanasro)

Director General
Antiquities and Archaeology
Culture, Tourism and Antiquities
Department
Government of Sindh

Data Analysis from the Weather Stations

Meteorological Report of three AWSs at Makli, Thatta, Sindh

Nadeem Faisal & Asif Hussain, PMD, Karachi

22nd November, 2018

1. Introduction

On the invitation of Director, Sindh Archeology Department, Karachi a team of Pakistan Meteorological Department (PMD) comprising of Nadeem Faisal, Deputy Director/Senior Meteorologist and Asif Hussain, Programmer visited Makli on 13th November 2018. Three Automatic Weather Stations manufactured (Davis, Vantage PRO2) installed at three locations of Makli, Thatta namely; City Campus, Fuzail Shah Qadri and Jam Nizam (Figure-1) were studied during visit.



Figure-1, Geographical location of three AWS sites

The data loggers were accessed through laptop and available data downloaded. The frequency of data logging was not constant and was variable over different period of time ranging from one minute to two hours' intervals. The major meteorological parameters recorded were temperature (°C), relative humidity (%), dew point temperature (°C), rainfall (mm), wind speed (km/hrs), wind direction (degree), barometric pressure (mbs), solar radiation etc. The downloaded data were processed at PMD Climate Data Centre, Karachi and considerable amount of data were found

missing during period 10th November 2017 to 12th November, 2018 (Table-1). The climatology of the three sites have been derived by taking data from December 2017 to October 2018 leaving preceding and later months due to paucity of data.

Table-1 Missing data days

Stations	Nov, 17	Dec, 17	Jan, 18	Feb, 18	Mar, 18	Apr, 18	May, 18	Jun, 18	Jul, 18	Aug, 18	Sep, 18	Oct, 18	Nov, 18	Total
Campus City	15	7	9	---	6	4	---	1	1	---	1	1	---	45
Fuzail Shah	20	7	---	---	8	---	---	---	3	1	13	12	---	64
Jam Nizam	21	8	5	9	5	3	---	2	3	27	21	28	12	144

2. Meteorology at City Campus site

The data for the period 10th November 2017 to 12 November 2018 recorded at City Campus site were processed and 12 % data during the period found missing. Box plot for extreme and average temperature of City Campus site depicted in Figure-2; the bottom whisker indicates the lowest temperature while an upper whisker indicates the highest maximum temperatures of each month. The upper & bottom parts of the boxes are representing the average maximum and minimum values and small size of black dotted lines in boxes are the average temperature values of each month.

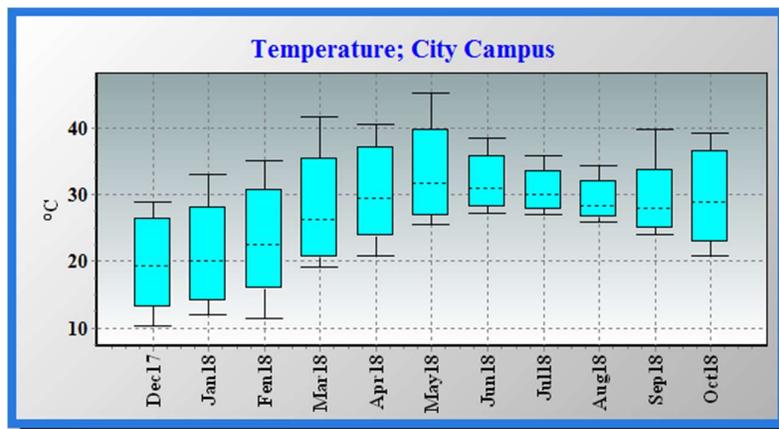


Figure-2, Box plot for temperature of City Campus site

Figure-3 illustrates the monthly wind speed (average & maximum) and monthly accumulated amount of rainfall at City Campus site. Very little rainfall was recorded in the monsoon season whereas maximum wind speed of 59 km/hrs. was recorded in June 2018.

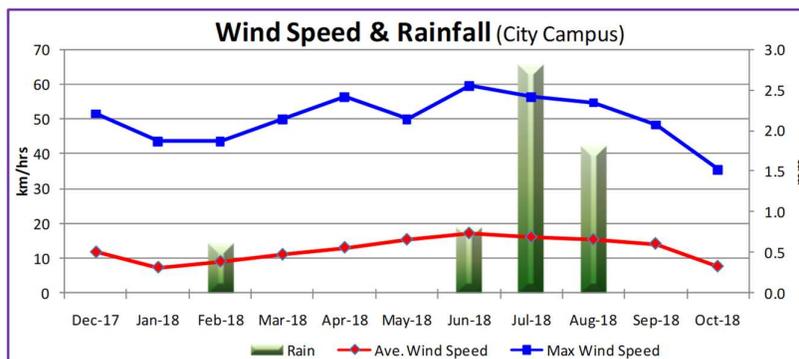


Figure-3, Wind and Rain Climatology at City Campus site

3. Meteorology at Fuzail Shah Qadri site

The data for the period 10th November 2017 to 12 November 2018 recorded at Fuzail Shah Qadri site were processed and 17 % data during the period found missing. Box plot for extreme and average temperature of Fuzail Shah Qadri depicts in Fig-4; the bottom whisker indicates the lowest temperature while an upper whisker indicates the highest maximum temperatures of each month. The upper & bottom parts of the boxes are representing the average maximum and minimum values and small size of black dotted lines in boxes are the average temperature values of each month.

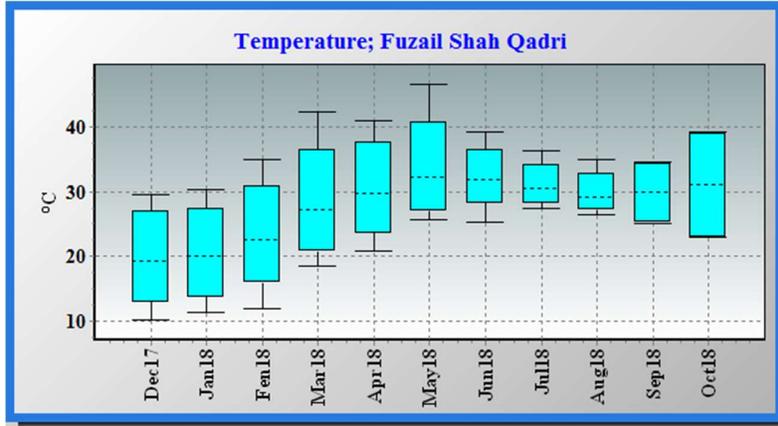


Figure-4, Box plot for temperature of Fuzail Shah Qadri site

Figure-5 illustrates the monthly wind speed (average & maximum) and monthly accumulated amount of rainfall at Fuzail Shah Qadri site. A considerable amount 28.9 mm of rainfall was recorded in the monsoon season (Jun-Aug) which is significantly larger amount while comparing with City Campus site. The maximum wind speed of 63 km/hrs was recorded in June 2018.

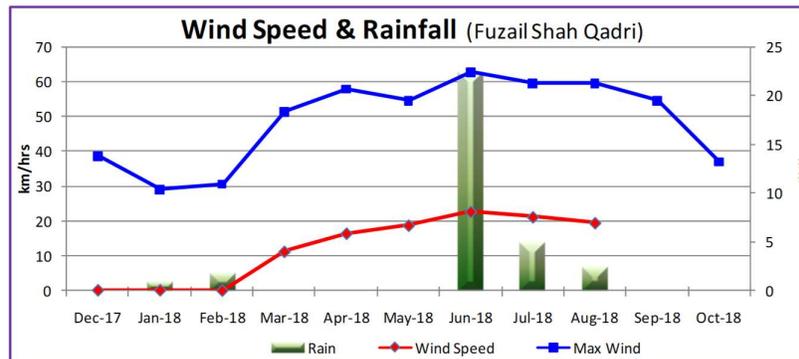


Figure-5, Wind and Rain Climatology at Fuzail Shaha Qadri site

4. Meteorology at Jam Nizam site

The data for the period 10th November 2017 to 12 November 2018 recorded at Jam Nizam site were processed and 39 % data during the period found missing. Box plot for extreme and average temperature of Jam Nizam site depicts in Fig-6; the bottom whisker indicates the lowest temperature while an upper whisker indicates the highest maximum temperatures of each month. The upper & bottom parts of the boxes are representing the average maximum and minimum values and small size of black dotted lines in boxes are the average temperature values of each month.

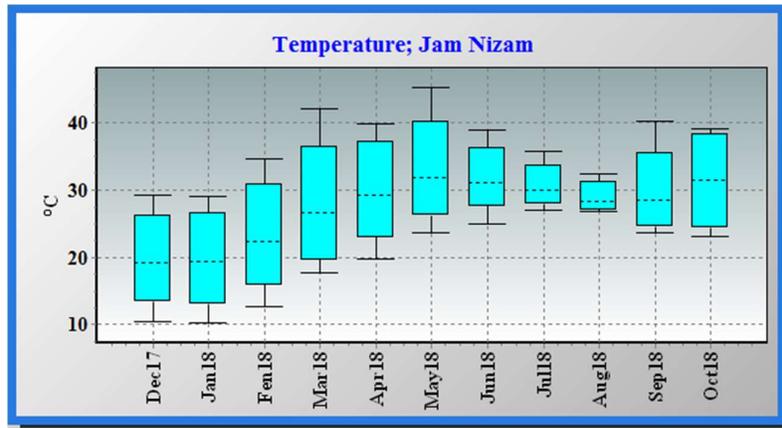


Figure-6. Box plot for temperature of Jam Nizam site

Figure-7 illustrates the monthly wind speed (average & maximum) and monthly accumulated amount of rainfall at Jam Nizam site. A considerable amount 25.4 mm of rainfall was recorded in the monsoon season (Jun-Jul) which is again significantly larger amount while comparing with City Campus site. The maximum wind speed of 563 km/hrs. was recorded in August 2018.

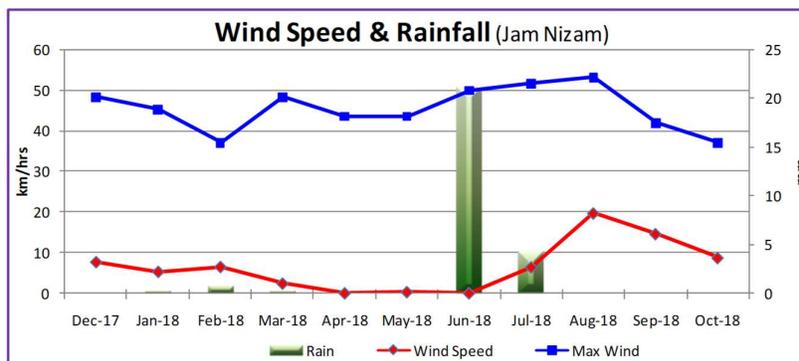


Figure-7. Wind and Rain Climatology at Jam Nizam site

5. Points to focus

It is recommended that in future following measures may be adopted in order to minimize the loss of precious data and improving the quality of data:

- a. **Uninterrupted power** supply to AWS system (logger & sensors)
- b. Regular **serviceability/function** checking of loggers
- c. Frequent **monitoring** of complete system
- d. At least **twice a week** downloading of data
- e. Additional data **backup** on external media
- f. The data recording interval should be standardized to **one hour**

Data Analysis from the Crack Monitors

Monument Name: TOMB OF JAM NIZAM AL DIN
 Date of Installation: 01-10-2017
 No of Tale Tells: 08 NOS
 Location: 03 NORTH SIDE OF THE TOP WALL
 03 SOUTH SIDE OF THE TOP WALL
 02 NORTH INSIDE OF THE WALL
 NC: No Change

TABLE 2017

S. No 2017	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1	N.C			N.C			N.C			N.C		
2	N.C			N.C			N.C			N.C		
3	N.C			N.C			N.C			N.C		
4	N.C			N.C			N.C			N.C		
5	N.C			N.C			N.C			N.C		
6	N.C			N.C			N.C			N.C		
7	N.C			N.C			N.C			N.C		
8	N.C			N.C			N.C			N.C		

TABLE 2018

S. No 2018	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1	N.C			N.C			N.C			N.C		
2	N.C			N.C			N.C			N.C		
3	N.C			N.C			N.C			N.C		
4	N.C			N.C			N.C			N.C		
5	N.C			N.C			N.C			N.C		
6	N.C			N.C			N.C			N.C		
7	N.C			N.C			N.C			N.C		

8	N.C			N.C			N.C			N.C		
9		NEW			N.C			N.C		INCIDENT		
10		INSTALL			N.C			N.C		REINSTALL		

Monument Name: TUGRAL BAIG
Date of Installation: 04-1-2017
No of Tale Tells: 02 NOS
Location: WEST SIDE OF MONUMENT
NO CHANGE (NC)

TABLE 2017

S. No	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1	N.C			N.C			N.C			N.C		
2	N.C			N.C			N.C			N.C		

2018

S.No 2018	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1	N.C			N.C			N.C			N.C		
2	N.C			N.C			N.C			N.C		

Monument Name: JANI BAIG
Date of Installation: 19-12-2016
No Of Tale Tells: 8 NOS
Location: TOP
NO CHANGE (NC)

2016/17

S. No 2017	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1	N.C			N.C			N.C			N.C		

2	N.C			N.C			N.C			N.C		
3	N.C			N.C			N.C			N.C		
4	N.C			N.C			N.C			N.C		
5	N.C			N.C			N.C			N.C		
6	N.C			N.C			N.C			N.C		
7	N.C			N.C			N.C			N.C		
8	NC			N.C			N.C			N.C		

Table 2018 JANI BAIG

S. No 2018	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
1	N.C			N.C			N.C			N.C		
2	N.C			N.C			N.C			N.C		
3	N.C			N.C			N.C			N.C		
4	N.C			N.C			N.C			N.C		
5	N.C			N.C			N.C			N.C		
6	N.C			N.C			N.C			N.C		
7	N.C			N.C			N.C			N.C		
8	NC			N.C			N.C			N.C		

Monument Name: DEWAN SHURFA KHAN
Date of Installation: 04-01-2017
No of Tale Tells: 2 Nos
Location: Top
NO CHANGE (NC)

TABLE 2017

S.NO 2017	JAN 04	FEB	MAR	APRIL 01	MAY	JUNE	JULY 01	AUG	SEP	OCT 01	NOV	DEC
1	NC			NC			NC			NC		
2	NC			NC			NC			NC		

TABLE 2018

S.NO 2018	JAN 04	FEB	MAR	APRIL 01	MAY	JUNE	JULY 01	AUG	SEP	OCT 01	NOV	DEC
1	NC			NC			NC			NC		
2	NC			NC			NC			NC		

Tomb of Jam Nizamuddin: Structural Assessment/Recommendations (Dr. Beckh)

Tomb of Jam Nizam Al Din
Makli World Heritage Site
Province of Sindh – Islamic Republic of Pakistan

Structural Damage assessment and recommended consolidation measures

Acknowledgements

This study has been carried out in close collaboration and joint financial and administrative support provided by the Culture, Tourism and Antiquities Department / Directorate of Antiquities and Archaeology, Government of Sindh and by UNESCO / WHC.

The author would like to express his gratitude to Mr Ayaz Kazi Mahessar (UNESCO provincial coordinator, Sindh) and Mr. Serfraz Nawaz Jatoi (Archaeological Conservator, Makli WH Site) for their kind help and support in the preparation of this study and on the ground in Makli.

Many thanks to Mr Tanveer Ahmed and Ms. Yasmeen Lari for providing important information about the history of the tomb of Jam Nizam al Din during conversations in Makli and Karachi.

Special thanks to Rand Eppich and to geologist Mathias Effler for providing crucial support in the preparation of this study.

Contents

1. Executive Summary
2. Layout and history of the tomb of Jam Nizam al Din
3. Settlement problem at the eastern side of the tomb
4. Darshan Jharoka
5. Recommended way forward
6. Photographic survey

1. Executive Summary

This report encapsulates the findings of a field trip to the necropolis of Makli in mid-February 2018. The field trip focussed on the recording and assessment of structural damages of the tomb of Jam Nizam al Din, which is considered one of the most important monuments within the world heritage site of Makli.

The study identifies two weak areas of the structure: Firstly, the subsidence of the eastern half of the monument, which is built next to a cliff that steps down eleven meters to the riverbed of a former tributary of the Indus river. Secondly, the perturbation of the most prominent feature of the tomb: the beautifully decorated central pilaster of the western façade, which is surmounted by the Darshan Jharoka balcony structure.

Subsidence of the eastern half of the monument: The proximity of the monument to the cliff as well as the deficient soil characteristics of the supporting ground have caused severe structural problems. The tomb has been built on top of a deeper soil layer of fine silt, which provides insufficient bearing resistance. Due to the ongoing erosion of the cliff and the receding location of its rim, the deeper layer of fine silt is not equally contained laterally in all directions. The bearing pressure exerted by the significant self-weight of the tomb causes not only subsidence (i.e. vertical settlement), but also the – though very slow but steady – lateral movement of the fine silt layer towards the bluff. Hence, the foundation walls of the eastern part of the tomb suffer from both subsidence as well as from the horizontal deformation of the deeper strata. The monument must have experienced settlement problems throughout its lifetime. However, the ongoing erosion of the cliff exacerbates the situation and accelerates the deterioration of the monument. In order to safeguard the monument it is essential to improve the soil characteristics of the subsoil and to contain the lateral movement of the deeper strata of fine silt. The situation should be addressed with a triad of geotechnical measures: firstly, the subsoil of the existing foundation walls should be improved with grout injections (lime or bentonite). As a prerequisite for this procedure, a thorough geo-radar scan of the subsoil inside and outside of the tomb is mandatory in order to detect any anthropogenic materials or artefacts. Secondly, the horizontal movement of the lower strata should be retained by a permeable assembly of bored piles. The small spacing between the piles will prevent any perturbation of the ground water flow, as the creation of a water barrier inside of the soil would have severe detrimental effects (for this reason, any insertion of a monolithic retaining wall should be strictly avoided). The pile assembly will need to be tied back into lower soil strata with injection anchors in order to provide sufficient horizontal stability. Lastly, the cliff needs to be protected against the ongoing erosion. As this problem is not limited to the site of Jam Nizam al Din alone (though most severe here), a

comprehensive solution should be conceived for the entire site. This slope stabilization plan needs to be coordinated with archaeologist and landscape architects.

Darshan Jharoka balcony structure: the passage of time as well as a series of past earthquakes have caused a variety of cracks and dislodgements at the ornate central pilaster of the western façade and the balcony structure. Many of the intricate stone elements have also suffered from heavy handed repair works and the use of cement mortar or the replacement of lost elements with ill-fitting components in the past. It is recommended to repair and strengthen the upper part of the balcony during by means of an anastylosis of the upper part of the drystone masonry. In order to improve the keying between the central pilaster and the main structure and to enhance the seismic resistance of the upper part of the balcony structure, the (concealed and reversible) inclusion of glass fibre reinforcement should be investigated.

2. **Layout and history of the tomb of Jam Nizam al Din**

The tomb of Jam Nizam Al Din Shah, also known as Jam Nindo, was built one year after his death in 1509. The tomb is part of the cluster of monuments on “Samma hill” – a high plateau in the northern parts of the necropolis of Makli. It is situated next to the ridge of the plateau, with an approximately 11.0m drop in terrain to the riverbed of a former tributary of the Indus. The geometry of the structure is roughly based on a cuboid – with a square footprint of 11.17m x 11.27m – and a height of approximately 8.50m above grade level. Purportedly, the outer dimensions were chosen to be vaguely reminiscent of the geometry of the Kaaba in Mecca.

The monument comprises a massive construction of stone masonry and renders a unique array of devotional carvings of outstanding quality on its wall faces. The masonry of the structure displays the highest level of artisanship. The most prominent feature of the monument are unmistakably its stone carvings at the central pilaster of the western facade.

2.1 Architectural layout of the monument

The main chamber of the tomb is accessed through an elaborately decorated entrance door at the western façade of the building. On the southern and northern wall, door openings are inserted into the walls of the ground floor (now fully or partly closed with brick infill panels). The lavishly decorated niche of the mihrab is integrated in the western wall of the building.

The main chamber consists of an open square space without any roof. The square layout of the inner chamber transitions by means of squinches into an octagon and further upwards into a hexadecagon. Although the transition from square to hexadecagon seems to imply the anticipated construction of a dome, the composition of the structural fabric elements not support this notion. The wall construction of the inner walls do not convey any provisions to bear the significant additional weight of a masonry dome. Furthermore, as was pointed out by the esteemed architectural historian Yasmeen Lari, the local stonemasons had neither the knowledge nor the experience to construct a real dome structure at the beginning of the sixteenth century. The observation that the masons were more familiar with the coeval trabeated construction techniques prevalent in the South-Asia than with the dome and vaulting techniques of Persia can be witnessed at various details of the tomb. So use the cusped-arch windows of the tomb a corbelled construction with projecting stones

instead of a real arch-like construction with voussoir stones. It is therefore not clear if the builders were proficient enough in arch – and dome construction to vault such a large space.

2.2 Composition of stone masonry

According to Mr. Tanveer Ahmed, the stones were most likely extracted at the quarry of Jungshahi, a village 20km apart from the building site. Basic material tests conducted at a small sample at a laboratory in Munich indicate that the stone can be classified as Dolostone / Dolomite rock. This is a sedimentary carbonate rock that contains a high percentage of the mineral Dolomite $\text{CaMg}(\text{CO}_3)_2$. Compared to limestone, it is slightly harder and less ductile (E-modulus range: 16.000 – 80.000N/mm²). Although the quality of stone is in general even and uniform, inclusions of iron can be seen at some of its surfaces.

The outer faces of the walls consist of dressed drystone masonry (ashlar). Most likely, the walls are composed of two faces of dressed stone masonry with a layer of rubble infill in between. This construction method was widely used for the vast majority of coeval monuments in the area. This assumption was further corroborated by an endoscopic survey (image 37).

The wall thicknesses vary with the cardinal directions from a minimum of approx. 1.04m at the east and north wall to approx. 1.65m at the south and west wall, which incorporate the narrow stairway to the Darshan Jharoka and the mihrab respectively. According to Mr. Tanveer Ahmed, the foundation wall on the eastern face of the building was found to be in a good condition, when he built the new retaining wall next to it in the year 1994. Mr. Ahmed mentioned that the base stone of the wall stepped out by approx. 22cm.

2.3 History of past repair and conservation works

No reliable records of past restorations and interventions of Jam Nizam al Din are available. In order to obtain a better understanding of the structural behaviour of the building in the past, a series of interviews with site managers, architects and conservation experts was carried out. According to various sources, the following timetable of past interventions and repair works could be reconstructed:

19th c. Possibly some restoration works carried out during the British reign

1956 Restoration carried out by the Department of Public Works. The door openings in the north and south walls are closed with stone masonry. The concrete flooring at the ground floor as well as the concrete layer at the top of the building are added, together with one to two courses of stone masonry bricks at the crown of the building. Gaps and cracks are patched with cement mortar. The adjacent small pavilion north of Jam Nizam al Din (Noori Jam Tamachi) is stabilized laterally with two steel columns (I sections) at around 45° and 70°.

1960s Apparently minor restoration works without record

1970s Apparently minor restoration works without record

1981 Inscription of Makli necropolis in the World Heritage List.

- 1994 An L-shaped retaining wall made of concrete is built next to the existing foundation wall at the eastern side of the building. The new wall has a distance of approx. 75cm to the existing one. The space above the lower leg of the L is filled with bricks laid in cement mortar.
- In the same year, all gaps and cracks of the stone masonry are filled with lime surkhi mortar.
- 1996 A concrete apron is placed next to the embankment on the northern side of the building in order to prevent the infiltration of rainwater into the soil.
- 2010 *Disastrous floods and displacement people on the site*
- 2011 *Comprehensive documentation and condition survey of the tomb by the Heritage Foundation of Pakistan*
- 2016 At the end of the year, the cementitious layer at the top of the building that had been put in place in the year 1956 was repaired as it showed many cracks in the north-south direction. Also some repointing of open cracks and horizontal dislodgements was carried out with cement mortar.
- 2017 At the beginning of the year crack meters are installed inside the building and at the top of the structure
- 2018 Additional crack meters are installed at various critical locations of the structure

3. Settlement problem at the eastern side of the tomb

3.1 Current structural condition

The south and north wall of the tomb show serious dislodgements of the dressed stone masonry. The subsidence of the eastern part of the building caused an uneven overall settlement of the structure, leading to severe perturbations of the stone masonry above. The history of the formation of cracks and dislodgements due to subsidence can be followed very clearly at the centres of the south and north wall. Here, the positioning of the door and window openings in the symmetry axis of the massive masonry walls created a weak point in the structure that acts like a hinge within the structure. Whereas the western half of the building remains stable, the eastern half of the building suffers from continuing subsidence and horizontal movement of the ground. Consequently, cracks and horizontal gaps in the masonry propagate upwards in the symmetry lines of the south and north wall.

It is quite likely that the unsatisfactory soil conditions became already apparent during the construction of the monument or shortly afterwards. The traces of continuing repair works during the 20th century and before suggest that the uneven settlement of the building has been ongoing for a very long time, albeit perhaps on a somewhat slower pace.

In 1994, a retaining wall was built just next to the eastern foundation wall. The L-shaped wall made of reinforced concrete and was embedded in brickwork. It now forms the embankment next to the slope. In the same campaign, the cracks in the masonry walls were also repaired and repointed with red coloured lime mortar

(surkhi). As the newly built retaining wall is not tied into the soil and only runs parallel to the existing foundation wall, it did nothing to stop nor contain the movement. In fact, soon after the retaining wall was built, new cracks formed along the retaining wall and in the masonry, particularly on the northern side of the building. The observation that the horizontal movement at the northern side - which is also bit closer to the edge of the cliff - is more acute than at the southern side can be witnessed at the encasement of the retaining wall at the eastern face of the building. Here, a longitudinal crack in south-north direction has formed just above the embedded reinforced concrete wall. The crack opens up from approx. 2mm at the southern end to about 20mm at the northern end.

During the 1994 restoration of the monument, all apparent cracks were patched with matching stone pieces and surkhi lime mortar. Today, it can clearly be seen that these cracks have meanwhile opened up by approx. 18 mm at the northern wall (image 12). At the southern wall, no significant openings next to the conservation works of 1994 are apparent. At the maximum, slight openings of about 3-4mm might have formed since the 1994 intervention. Since the installation of the crack meters at various locations at the building by the end of 2017, no movement could be discerned. However, the accuracy of the installed crack meters is not high enough to discern small movements below 1mm. The crack openings on the north wall suggest an ongoing movement of approx. 1 mm per year on the northern side and about a third of that on the southern side of the monument.

3.2 Diagnosis

During the “comprehensive documentation and condition survey” carried out by the Heritage Foundation of Pakistan in 2011, a geotechnical survey was undertaken by “Consolidated Engineering Services” (ces) engineers from Karachi (with support from UNESCO). CES drilled four 15m deep boreholes around the monument and analysed the soil of the varying layers. The report of their mission stated that the top layer of earth was originally limestone. Due to exposure to the elements, it had disintegrated into smaller pieces. Immediately below the fragments of rock is an approximately 4.5m (15 feet) layer of lime stone and below this is a 4.5m (15 feet) layer of “shale”, followed again by a layer of limestone.

The term “shale” is used by ces to identify “dense silt”, a clayish loam with markedly plastic behaviour. The physical properties of the material change if inundated or exposed to water for a longer period. In this instance, the stiffness of the material decreases noticeably. Furthermore, if exposed to the weather, this material can deteriorate and disintegrate quite rapidly. The erosion process of the cliff was already described by ces in their final report: since the soft layer of loam erodes quite quickly under atmospheric exposure, it leads to the landslip of the limestone layer above. The ongoing erosion of the bluff can be witnessed at the example of a sepulchral structure below Jam Nizam al Din, which has been partly carried away due to the ongoing degradation of the slope (See image 7).

The ongoing erosion of the layer of loam at the cliff has an important effect of the stability of Jam Nizam al Din: under normal conditions, the weak layer of loam would be contained in every direction and not able to expand in any direction.

However, as the ongoing erosion of the cliff has already substantially decreased the distance between the edge of the cliff and the foundations of the tomb. Consequently, the layer of loam is not equally constrained in all directions any more. Subjected to the heavy mass of the tomb, it will expand eastwards, as the decreasing distance to the cliff provides no restraint any more horizontal expansion in this direction. This effect is exacerbated if the moisture content of the layer rises. For this reason, it is quite harmful that the waterspout currently dewateres directly into the gap between the existing foundation wall and the retaining wall (image 13).

In effect, this means that the foundations (i.e. their eastern part) are not only subjected to vertical settlement but also to horizontal movement. This can be seen very clearly at image 18.

3.3 Proposed intervention

In order to contain the ongoing movement in the best possible way, the author recommends a multitiered approach. It will consist of the improvement of the soil adjacent and below of the existing foundations with injections, the containment of the soft clayish soil layer by means of a permeable bored pile wall, as well as an coordinated solution to secure and retain the cliff areas in the entire core zone.

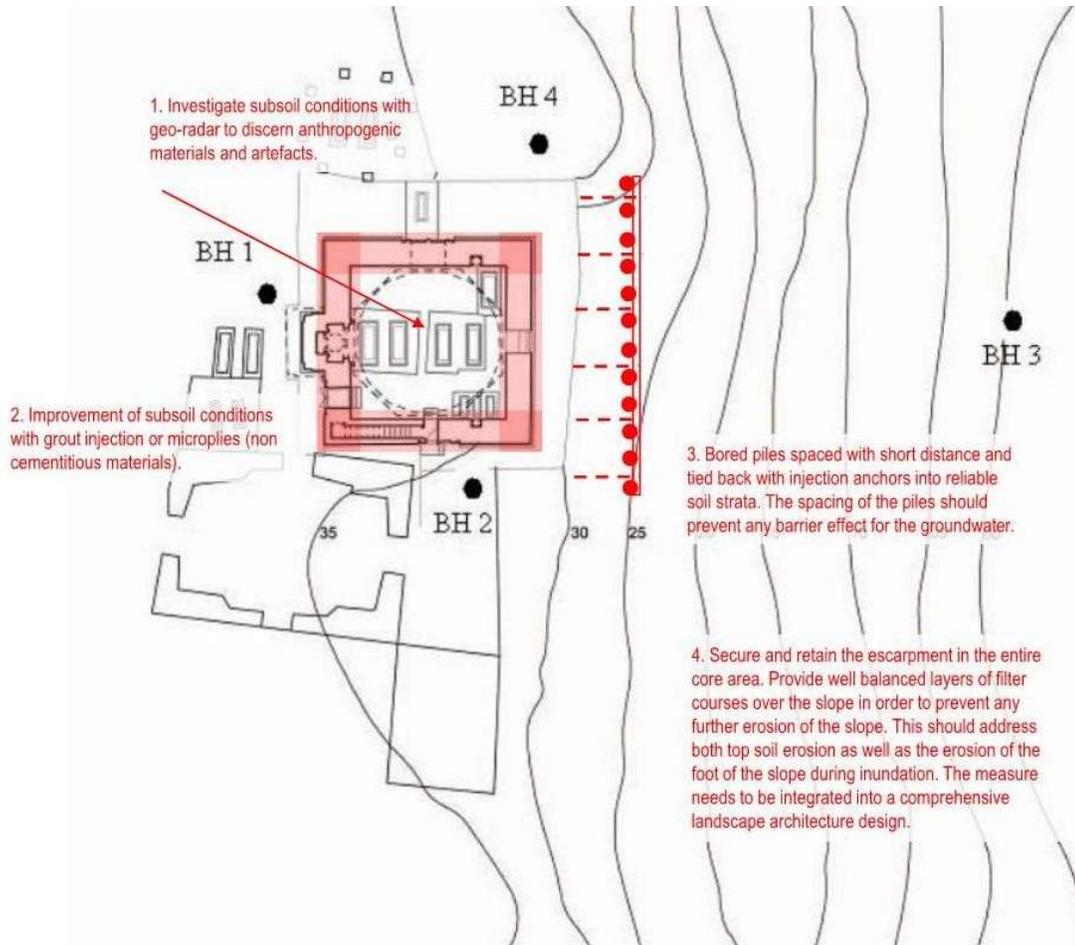
a) Grout injections / Micropiles

In order to decrease the actual bearing pressure beneath the existing foundations and to improve the conditions of the load bearing strata, it is recommended to investigate the applicability of grout injections or micropiles.

As a grouting material of the micropiles, cementitious mixtures should be avoided for their incompatible mechanical characteristics. Instead, lime-based injection materials should be considered. As another alternative bentonite, a grouting material that also exists in nature, should be investigated.

In order to understand the current situation of the existing foundation walls better – to assess their quality and to ascertain their depth, test pits should be dug at three locations (outside of the south and north wall doorways as well as on the northeast corner).

This intervention should only be considered after a thorough investigation of the soil conditions within the tomb. In order to avoid any potential disturbance of archaeological artefacts, a geo-radar study should be performed first.



b) Permeable pile wall

In order to contain the movement of the tomb, an open pile wall should be inserted in the soil approx. 3.0m off the newly built retaining wall of 1994. It is important that these piles are aligned with a clear spacing in order to not disturb the equilibrium of the water table beneath the surface. For this reason, the insertion of any wall should be strictly avoided. The resulting barrier effect would quite likely be detrimental. A horizontal beam should connect the piles and serve as a basis for the injection anchors. The anchors themselves should be tied into the lower limestone layer.

(Only recently, another retrofitting scheme was conceived by ESS-I-AAR consulting engineers from

Karachi for the Endowment Fund Trust (EFT). This scheme consists of an invasive U-shaped retaining

wall system. Due to its imposing and disproportionate size this structure would not be fitting into the sensitive surroundings. Apart from that, it is likely that the RC retaining walls will significantly change the water table at the foundation level which might have detrimental effects on the settlement. As this solution is also just embedded into the surrounding soil, it is no clear how it should provide enough resistance against movement.)

c) Slope stabilization strategy

In order to secure the cliff area against further erosion, a comprehensive solution needs to be developed. For this purpose, a geotechnical slope stabilization with granular filters (and geotextiles) needs to be designed. This measure should protect both, the rim of the bluff as well as the bottom of the cliff in case of flooding of the riverbed. Although the erosion problem is most acute at the tomb of Jam Nizam al Din, it can also be noticed at many other locations along the cliff.

For the development of a slope stabilization strategy, the close collaboration between a geotechnical engineer, archaeologists and a landscape architect is imperative.

4. Darshan Jharoka

4.1 Current structural condition

The prominent balcony structure at the Western face of the monument – the Darshan Jharoka – is the most prominent feature of the tomb of Jam Nizam al Din. The quality of the stone carving is of exquisite beauty and finesse. The central risalit of Darshan Jharoka shows partial detachment from the west wall of the tomb. Vertical gaps have opened up between the balcony structure and the main building due to insufficient keying of stone elements between the two parts.

A variety of earthquakes (1668, 1819, 1945, 1947) have affected the site of Makli in the past. As only minimal differential settlements can be detected in this area, it is very likely that the cracks and dislodgements originate not from subsidence but from past earthquakes and tremors.

The earthquake damages at the Darshan Jharoka and the ensuing heavy-handed repair works have led to a structurally unsound and improper condition of much of the upper part of the balcony area. Gaps and dislodgements in the stone masonry have been patched or repointed - often in a very unsightly manner. The majority of the historic iron clamps that were once joining the stone slabs are missing. Original parts like door jambs, pilasters and other elements are missing. Most notably, the original column on the north-western corner of the balcony has been replaced by a mismatching column of unknown origin. As this element is too high, it also causes disturbance at the lintels above, which are not aligned horizontally as a result.

Currently, there seems to be no ongoing deformation at the Darshan Jharoka. This observation is substantiated by the fact that the repointed areas in the niche of the mihrab (carried out 1994) are still intact and show no signs of movement.

4.2 Proposed intervention

Although the Darshan Jharoka is not in imminent danger, it has suffered significantly in the past due to earthquake damages and inappropriate repair works. This has overall led to a significant weakening of its structural integrity. As the structure of the balcony with its long cantilevers is already very ambitious, only a small tremor could already lead to substantial further damage of the stone elements.

It is recommended to repair and strengthen the upper part of the balcony during by means of an anastylosis of the upper part of the drystone masonry. For this purpose, the cracked and dislodged stone down to approx. 1.8m below the balcony structure should be carefully disassembled. The cracked or damaged stone elements should be repaired in a stone conservation laboratory (to be set up inside of the entrance office facilities). The anastylosis and stone conservation works must be carried out by stone conservation experts with proven experience and expertise in the conservation of comparable monuments. In order to improve the keying between the central pilaster and the main structure and to enhance the seismic resistance of the upper part of the

balcony structure, the (concealed and reversible) inclusion of glass fibre reinforcement should be investigated.

5. Recommended next steps and outlook

The following steps should be taken as soon as possible to ensure a timely response to safeguard the tomb of Jam Nizam al Din:

1. High-precision crack meters should be installed at various locations of the structure to monitor the movement of the tomb more accurately
2. All crack meters need to be monitored and recorded at least once per month (with photographs)
3. A geo-radar analysis of the subsoil inside and around the tomb should be carried out in order to locate any anthropogenic materials and artefacts
4. If the outcome of the geo-radar analysis allows, test pits should be dug at least two locations in order to assess the depth of the existing foundations wall and their quality. Ideally, the test pits should be located at the center of the south and north walls in order to see how the existing crack pattern propagates downwards.
5. Small probes of the stone and mortar should be taken in order to undertake material tests to study the chemical structure of the stone as well as its mechanical properties like compressive strength and E-modulus.
6. Based on the outcome of the steps 1 – 3, a detailed structural engineering design should be prepared.

6. Photographic Survey



Image 1: Samma cluster at the northern end of Makli necropolis. The cuboid volume of the Jam Nizam al Din tomb can be seen on the right.



Image 2: Western face of Jam Nizam al Din tomb.

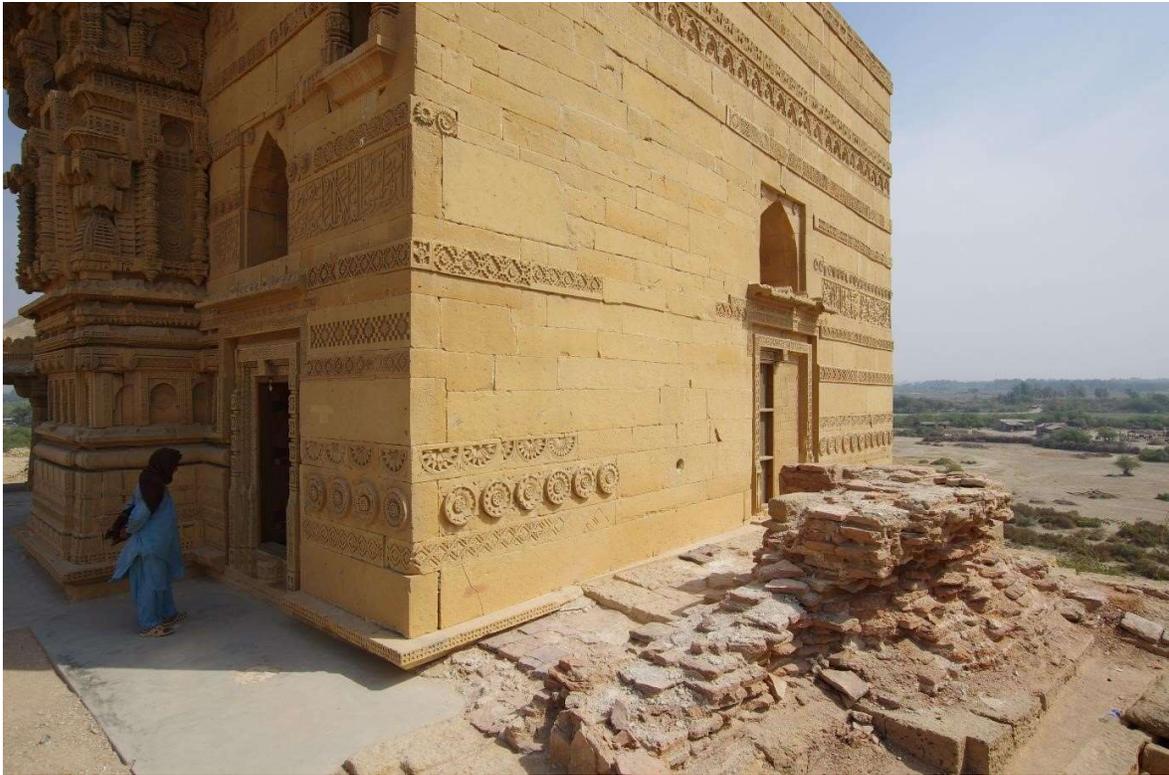


Image 3: South-west corner with remnants of an older sepulchral structure south of Jam Nizam al Din.

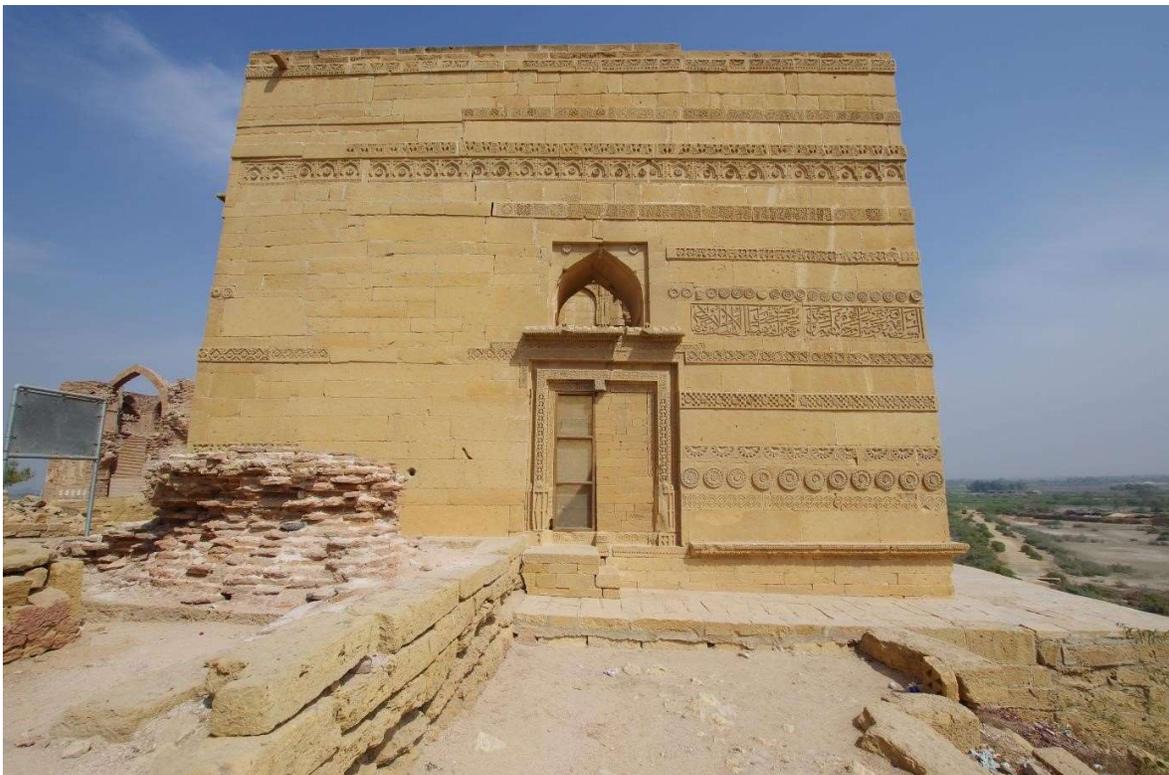


Image 4: South façade of Jam Nizam al Din.

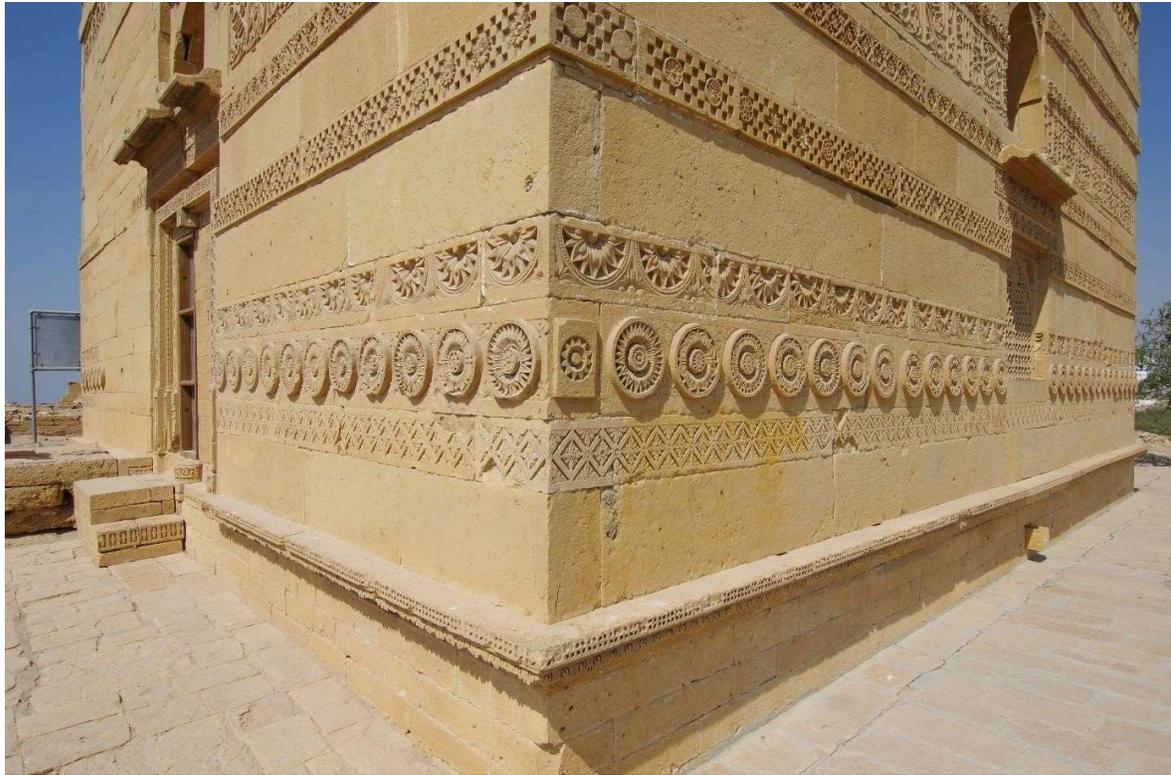


Image 5: South-east corner of Jam Nizam al Din.



Image 6: View from the slope to the south-east corner of the building.



Image 7: Remnants of a tomb structure south-east of Jam Nizam al Din. The structure collapsed due to the erosion of the slope.



Image 8: View from the dry riverbed below to the eastern face of the building.



Image 9: View from the dry riverbed below to the north-eastern corner of the building.



Image 10: North-eastern corner of the building with the masonry encased retaining wall installed in 1994 and (in the foreground) the concrete apron installed in 1996.

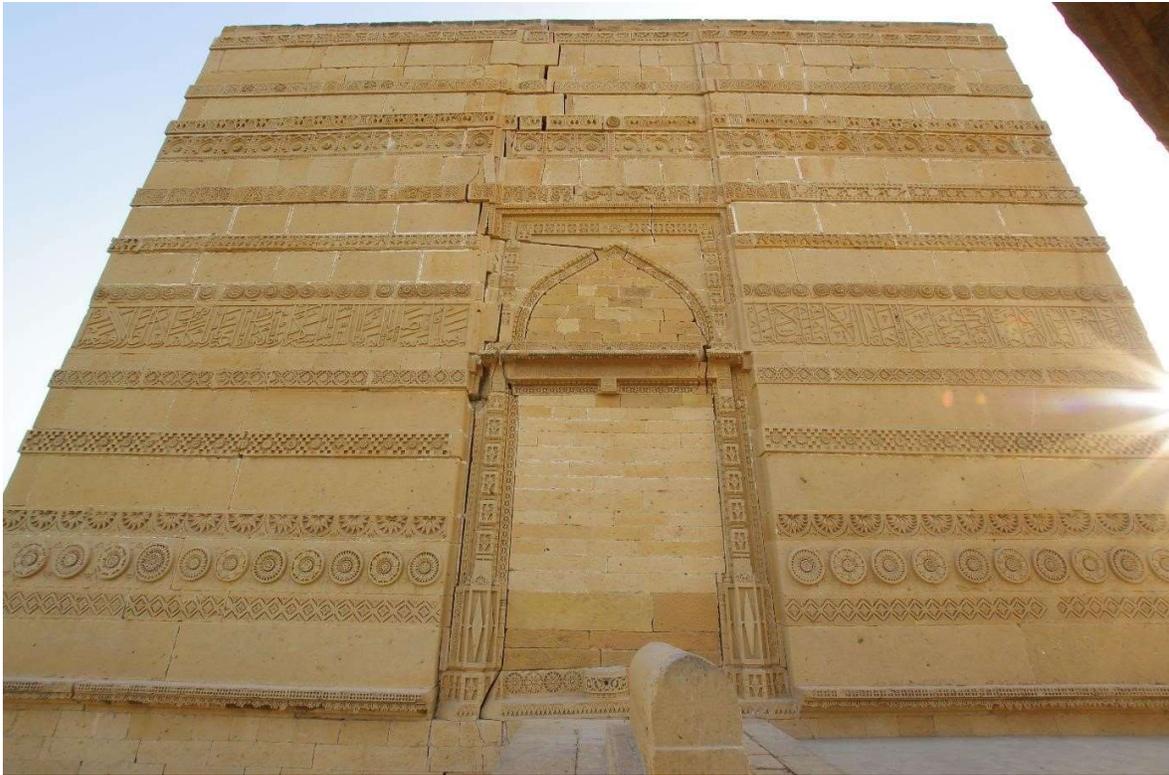


Image 11: North façade of Jam Nizam al Din, showing the sealed northern doorway and the series of cracks above.



Image 12: Upper part of north façade with opening gaps between the stone elements (some former infill patches caved outwards and are missing, the maximum opening since 1994 measures approx. 18mm.)



Image 13: Encasement of the added retaining wall (1994), showing a horizontal gap with increasing width from south to north. Note that the waterspout that drains the central space dewaters directly into the crack between the foundation wall and the newly built retaining wall, which is encased in the plinth (built in 1994). The water is trapped in the gap in between and is funnelled directly to the moisture-sensitive clayish layer below the foundation walls.



Image 14: North-east corner of Jam Nizam al Din with the encased retaining wall (built in 1994) and – below, right side, the newly added apron made of cement mortar for rainwater protection.



Image 15: Central space of the tomb, looking east.

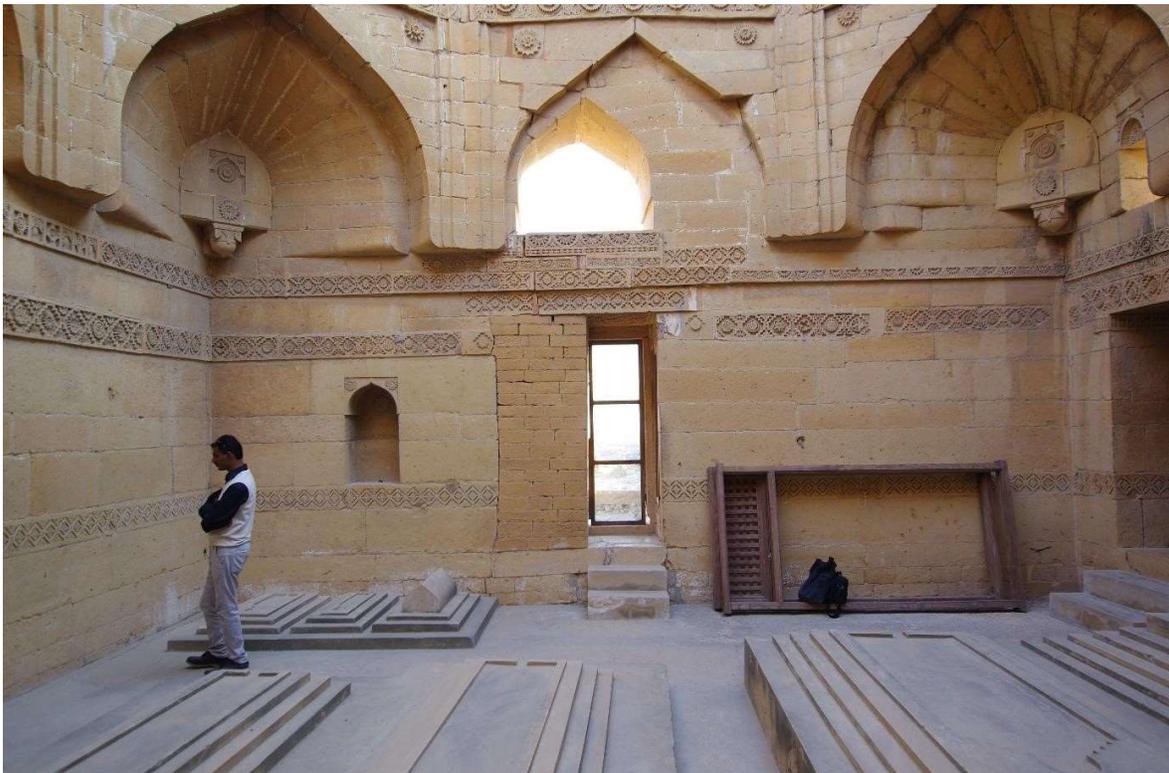


Image 16: Central space of the tomb, looking south (the infill of the south gateway was most likely added in 1956).

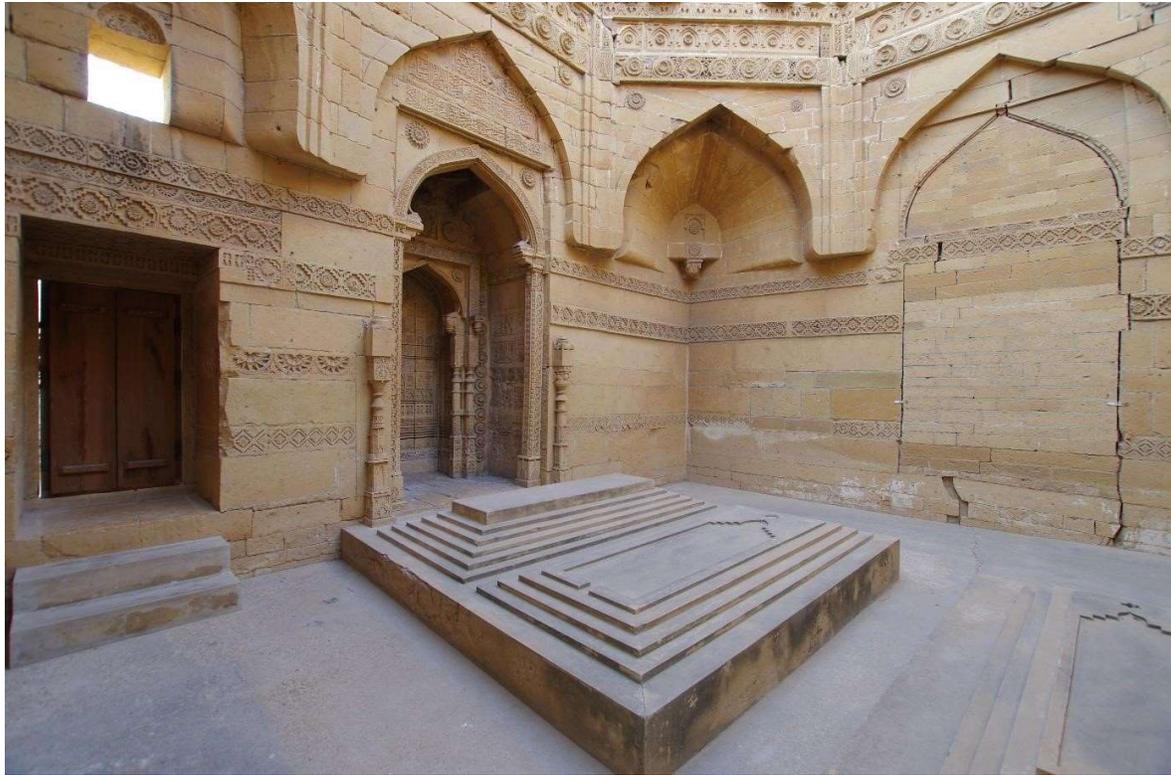


Image 17: North-west corner of the central space of the tomb with the mihrab.

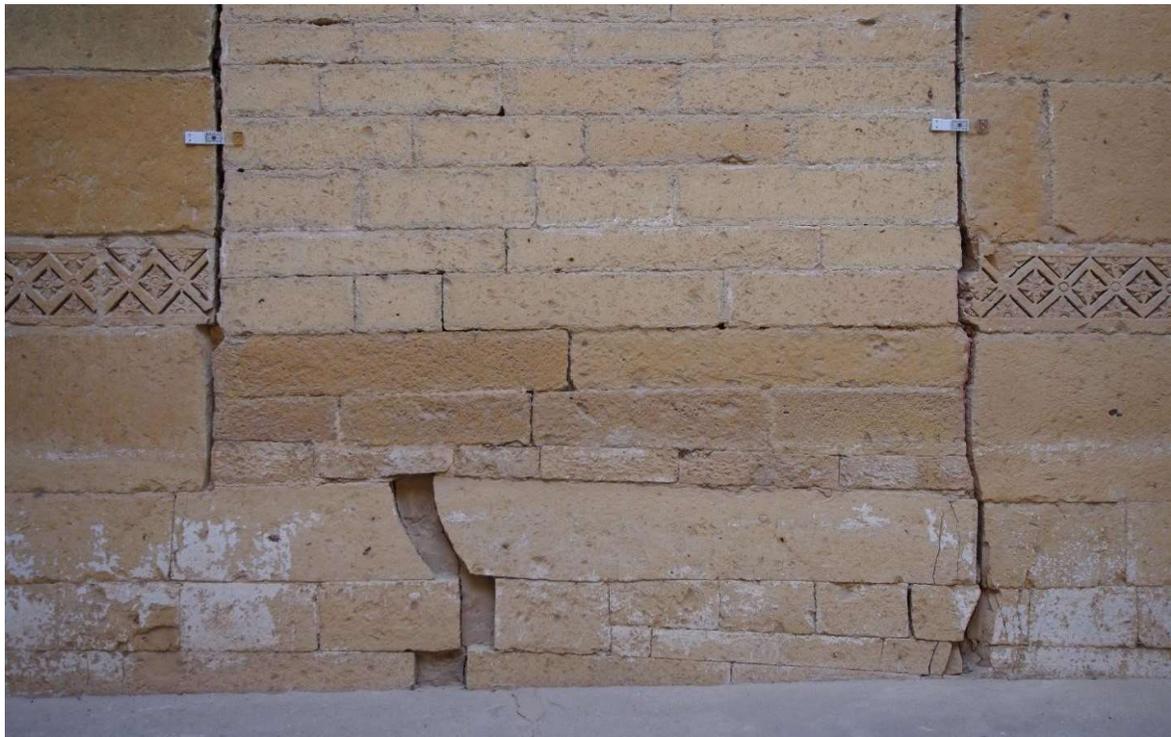


Image 18: Sealed northern doorway with installed crack-meters. The lower (previously sealed!) crack through the lowest three courses shows very clearly that the foundations of the monument are not only subject to vertical settlement but also to horizontal sliding.



Image 19: Inner face of western wall with the mihrab.

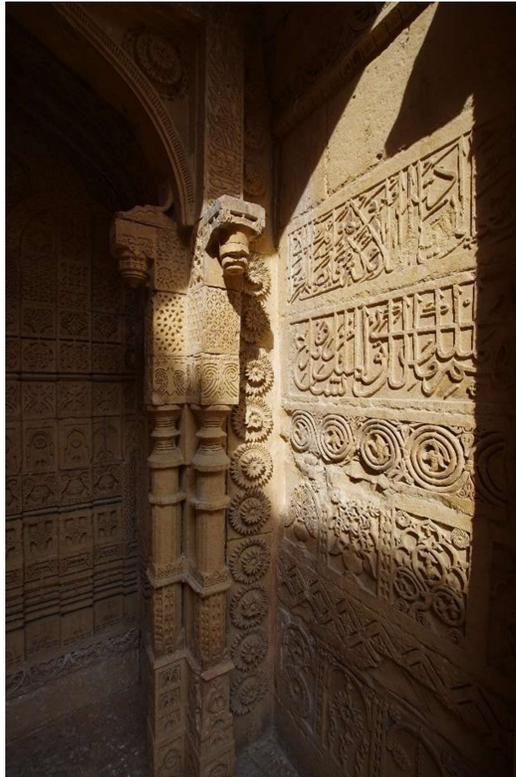
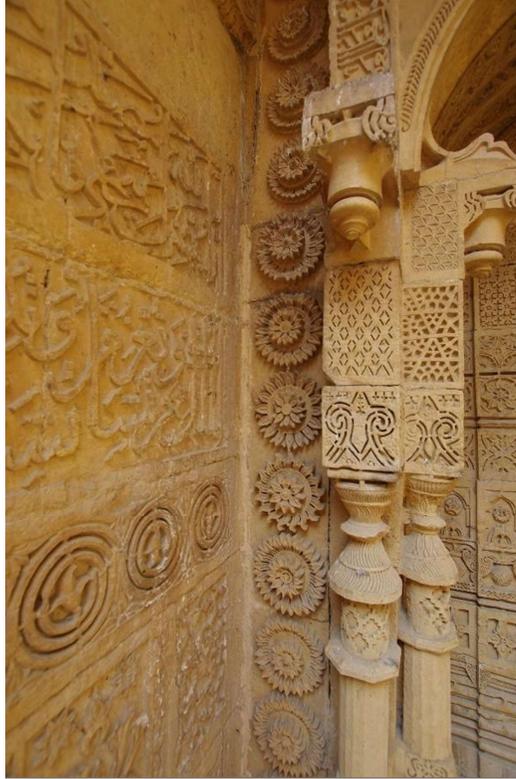


Image 20 a/b: Repointed former cracks inside of the mihrab (carried out in 1994)



Image 21: Central space of the tomb, looking upwards.



Image 22: Central space of the tomb, looking upwards, showing the transition from square via octagon to hexadecagon.

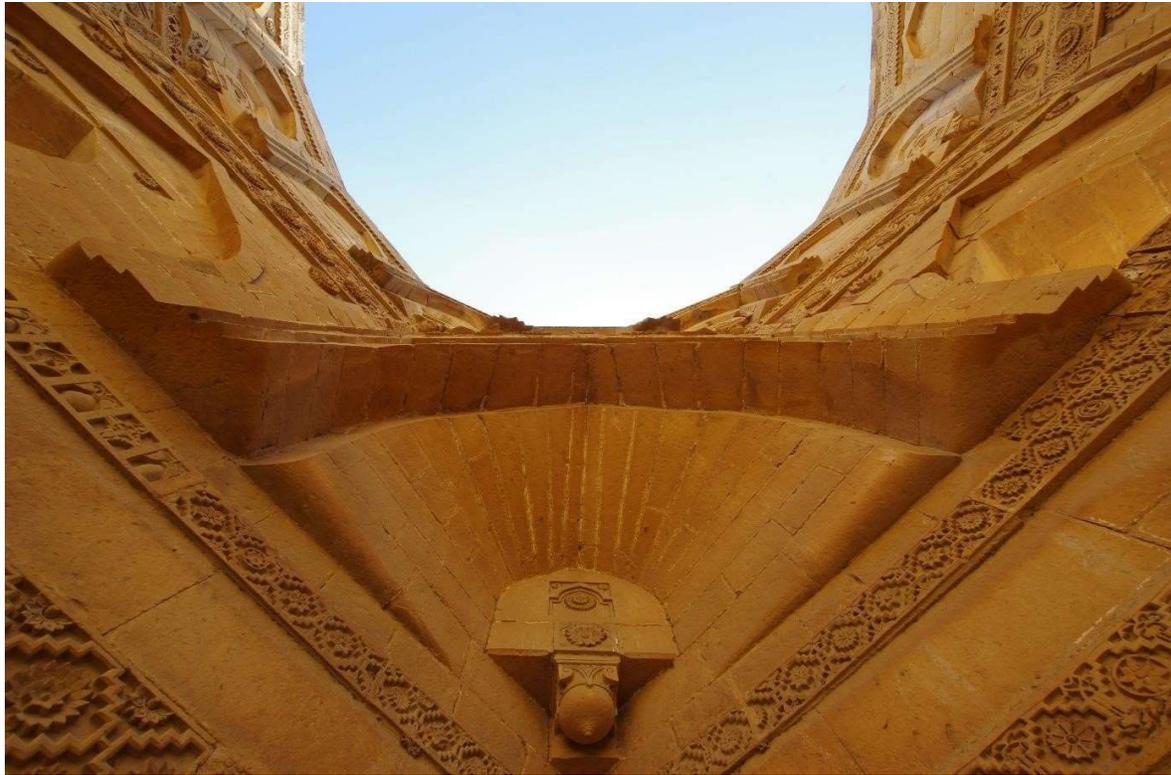
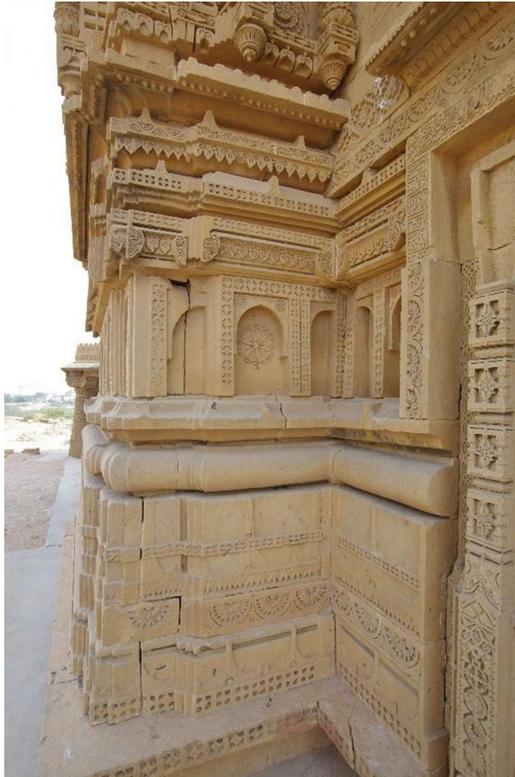
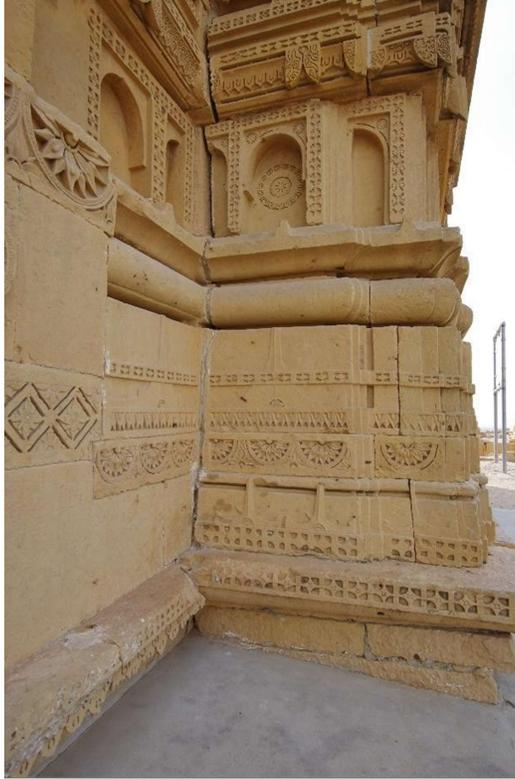


Image 23: Central space of the tomb with squinches seen from below.



Image 24: Central risalit, looking upwards, with severe cracks below the protruding balcony structure and elements bulging outwards left of the symmetry axis.



Images 25 a/b: Lower part of central risalit from north / south – with a continuous vertical gap on the north side.



Image 26: Vestibule of the Darshan Jharoka, looking east.



Image 27: Vestibule of the Darshan Jharoka, looking west.



Image 28: Vestibule of the Darshan Jharoka, looking south-west.



Image 29: Vestibule of the Darshan Jharoka, looking north-west.



Image 30: Vestibule of the Darshan Jharoka, looking south, with the broken lintel above the doorway.



Image 31: Vestibule of the Darshan Jharoka, stone planks with missing iron clamps.



Image 32: Upper entablature of balcony structure, looking north. The disruption and perturbation of the structural elements is clearly visible, with wide (partly repointed) gaps, dislodgements and misalignments and lost original elements (e.g. post on the left hand side).



Image 33: Upper entablature of balcony structure, looking south.



Image 34: Top view of the balcony structure, showing the severe dislodgements and misalignments.



Image 35: Top level with cement flooring and the two added courses of stones (1956).



Image 36: Top level with cement flooring and the two added courses of stones (probably carried out in 1956 by the department of public works).



Image 37: Endoscopic view of a cavity next to the gateway at the northern wall, showing the inner layer of rubble stones.



Image 38: Endoscopic view of crack between the detached central pilaster and the main structure. It shows a patched crack within the mihrab niche (taken from the opposite site).

Living Heritage Report

Introduction

The World Heritage property, Historical Monuments at Makli, is a unique place, an ancient necropolis full of life. Makli is visited daily by the thousands. Surrounding communities pray at the nearly twenty active shrines contained within its boundaries, visit family tombs, and gather together to escape the city. This interaction makes the site a dynamic living place of veneration, assembly, and recreation. Continued access to the site must be encouraged yet carefully managed as to minimize the impact on the fragile site.

It will take time to address all of the concerns of the World Heritage Committee, international experts, and the Reactive Monitoring Team. Nevertheless one topic mostly omitted from this list is the living nature and intangible value of Makli to surrounding communities.

Why is this important?

“This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.”¹

Thus, one crucial aspect of Makli, beyond the stone and brick and their condition, is the interaction people have with Makli. They frequently visit the twenty-one active shrines² as well as family tombs, and the site is used recreationally by residents of Thatta to escape the city. Visitors could number into the thousands on Thursday nights and, most likely, even higher during festivals. Visitation and use must be encouraged and facilitated while simultaneously reducing any impacts to the site.

Visitors have a serious impact on the site and the fragile monuments from their cars to well-worn paths that crisscross the site. Thus, proper visitor management is essential beginning with an education program available for all visitors. There are limited statistics on the number of visitors, the frequency of visits, where they go or how they arrive. Methods must be investigated for counting visitors including infrared sensors deployed at entrances or through collaboration with a nearby university. Such information will assist in assigning guard schedules or closing certain monuments at peak periods to reduce impact. While private vehicles have been restricted more could be done in this respect by further defining paths and roadways. The use of electric buses on site has significantly reduced the noise and has resulted in a more peaceful and spiritual visit.

¹ UNESCO Convention for the Safeguarding of Intangible Cultural Heritage

² 12 are highly active with 8 additional shrines identified for a total of approx. 20

During recent sessions at Makli, a map and list were made of all the active shrines within the borders of the site. This exercise was extremely useful as each shrine, given its religious nature, has individual caretakers. These were all visited at the end of 2016 and again in January 2017. Each has its different issues as some are located within significant monuments while others are adjacent or within non-significant or non-contributing structures.

In conclusion, the state of condition of the material fabric of Makli is very important, it must also be realized that the site is heavily used and must remain open. Thus, the team at Makli and within the Directorate are investigating why visitors come to the site through cooperation with a local university to conduct a visitor survey. This will form the basis of a visitor plan that will become an integral part of the Management Plan.



Figure 1 –Makli is a living site with thousands of visitors (Eppich, 2017)

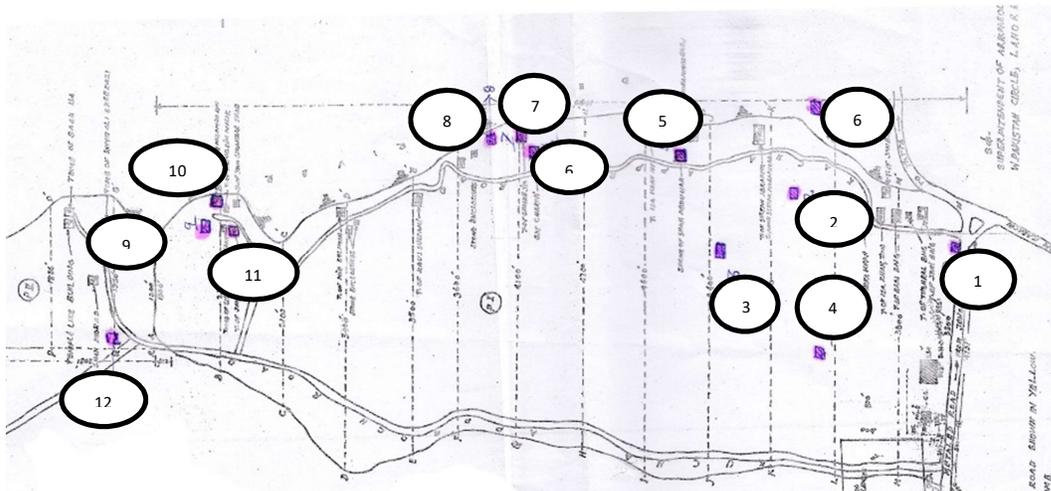


Figure 2 - of the more than 20 active shrines at Makli 1) Shah Abdul Karim Bukhari, 2) Junman Shah Jalali, 3) Fazal Shah Qadri, 4) Shah Parian (women's shrine), 5) Abdulla Shah Asabi, 6) Shah Gudroon, 7) Shaikh Geo, 8) Bibi Shirin (near Shaikh Geo), 9) Mai Makli, 10) Jam Nizamuddin tomb, 11) Dulah Darya Khan, 12) Mula Lutter

Proposed Makli Visitor Survey
Makli World Heritage property, Jan. 2018
Location _____

Date _____
Interviewer Name _____

Hello.

Would you be willing to take a survey to help Makli provide a better visitor experience? We are interested in your opinion of your visit. We wish suggestions for how we might improve the visit for everyone who comes to enjoy this important cultural, historical, and natural site. This will only take a few minutes and **all answers are anonymous**. Thank you!

Male Female

1. Is this your first visit to Makli? yes no
 - a. If this is not your visit, how many times have you been here? _____
 - b. When were you last here? _____
 - c. Was your impression better or worse than the last time? Better Worse
2. What City are you from? _____
3. How did you arrive?
 Private car Special tour Taxi Bus
4. How long was your visit? 1hr 1.5hrs 2hrs 2.5hrs 3 or more hrs
5. Was the visit too long? too short?
6. What was your general impression of the site?
 Excellent Good Neutral Poor Horrible
7. How did you feel about each of the following?

Tombs	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible
Site appearance (clean)	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible
Access to the site	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible
Views	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible
Natural Environment	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible
Staff	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible
Ticket Price	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible
Restrooms	<input type="checkbox"/>	Excellent	<input type="checkbox"/>	Good	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Poor	<input type="checkbox"/>	Horrible

Gift shop Excellent Good Neutral Poor
Horrible
Electric bus Excellent Good Neutral Poor
Horrible

8. What was your favorite experience at the site?

9. What would make your experience better?

10. Why did you come to Makli?

11. Did you learn more about Makli from your visit?

12. How did you learn about Makli?

Newspaper Website Social media Friends School

13. Did you know about Makli before your visit?

Yes No

14. Do you think it is important to preserve Makli?

Yes No

15. Did you know that your ticket purchase price helped preserve Makli?

Yes No

a. Would you be willing to pay more and how much?

200 150 100 50 10

16. Would you be willing to pay more if you had a special guided tour of the tombs?

Yes No

a. How much? 200 150 100 50 10

17. Would you be willing to buy tickets in advance?

Yes No

Thank you for your time. We hope you enjoy your visit. Your answers will help us in improving the experience at Makli. If you have any more to share please use the space below.

Visitor Plan Outline

There is no set formula or rigid outline for creating a Visitor Plan. However, there are some components that must be included. These components have been placed into an outline that aids in collecting the information needed, create a structure for the hierarchal connection between goals, objectives and tasks, and helps to coordinate actions between those involved. This structure ensures that individual and group initiatives contribute toward the longer term stated vision. Below is the suggested outline that this report follows.

- I. Summary**
 - a. Problem statement
 - b. Benefits of a Visitor Management Plan
 - c. Coordination
- II. Method / Baseline information**
 - a. Research review
 - b. On-site observations, interviews
 - c. Carrying Capacity Study
 - d. Visitor Survey
 - e. Consultation, inclusion of stakeholders
 - f. Constraint analysis, barriers to implementation
 - g. Management discussions
- III. Vision**
- IV. Goals (long-term), objectives (mid-term to reach goals), tasks (short-term specific actions to meet goals),**
- V. Implementation**
 - a. Management & Institutional arrangements who does what?
 - b. Monitoring, Evaluation & Indicators
 - c. Contingencies
 - d. Management Strategy (Logical Framework)

Bibliography
Case studies

Desecration of Graves

Directorate of Antiquities and Archaeology
Culture, Tourism and Antiquities Department
Government of Sindh

Dated: 29th October, 2018

The Desecration of Graves at the Samma Cluster, Historical Monuments at Makli, Thatta (Ref. 143)

DAMAGE ASSESSMENT REPORT

The Directorate of Antiquities and Archaeology, Culture, Tourism and Antiquities Department, Government of Sindh is deeply concerned and saddened at the recent attempts to desecrate the graves at the Samma Cluster of the Historical Monuments at Makli, Thatta. After a careful situation analysis, and in close cooperation with the regional police, it seems that the intention was not only aimed at desecrating the graves but also consisted of damaging the crack monitors installed at the mausoleum of Jam Nizamuddin and also partially damaging the weather station. While the offenders are in the police custody, their intentions for carrying out this horrendous act are not yet known.

Recent actions, of which the World Heritage Centre of UNESCO is aware, taken by the Directorate may have been a motivation. These have not been popular among certain groups who have been illegally occupying the site. Other actions, namely; stopping the contemporary burials, notifying illegal encroachment settlements, and constructing the remaining portion of the barrier wall (in progress) may also have been factors.

However, the Department stands firm and resolute in its commitment in safeguarding the site from all elements of illegal occupation. Our efforts for removing the encroachments are continuing. This is to report that the Directorate has increased the security of the site by hiring additional guards in addition to stopping all vehicular traffic.

This report consists the details of the incident, damage assessment and actions taken by the Directorate of Antiquities and Archaeology.

The Incident

The offenders attempted to destroy the weather stations and desecrating the graves on 25th September, 2018 wherein the suspected persons removed data logger from the weather station installed at cluster-II. The incident was immediately reported to the local police station by the site management staff and the suspect was apprehended and is in police custody. The detached data logger was later recovered, lying adjacent to the weather station. It has been professionally reinstalled.

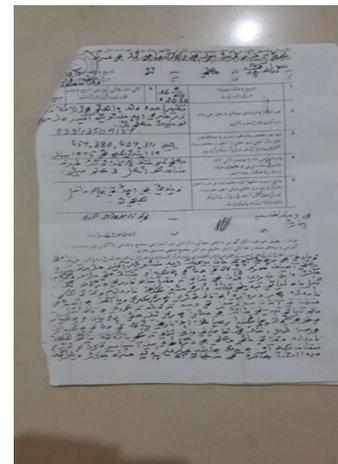
In another incident the suspect attempted to dislodge the cracked grave stones of 4 graves adjacent to the mausoleum of Jam Nizamuddin at the Samma cluster. Reportedly, he also pulled and broke the cable of another weather station installed at the cluster. He also managed to enter the mausoleum of Jam Nizamuddin from a wooden entrance located at the southern wall of the mausoleum. He broke and removed 4 crack monitors installed at different locations inside the mausoleum. While he was in process of committing further damage, he was caught by the guards and was handed over to police. The site management staff lodged a formal complaint (FIR) against the suspect and the interrogation is in process.

The Culture Department took serious note on the two incidents and contacted the district authorities for further investigation and consultation on the matter. An urgent meeting of Makli Steering Committee was called for assessing the situation and suggesting measures in improving the security measures at the site. The site management is working closely with the regional police to evaluate the security of the entire site, additional lighting, and CCTV cameras at key monuments are being considered. A budget is being prepared and the Makli Steering Committee will meet again later this year. The opening that the suspect used to gain access into the tomb of Jam Nizamuddin is being reinforced, and the crack monitors are re-installed.



Photo 1: The suspect being arrested by police

Photo 2: Copy of the FIR



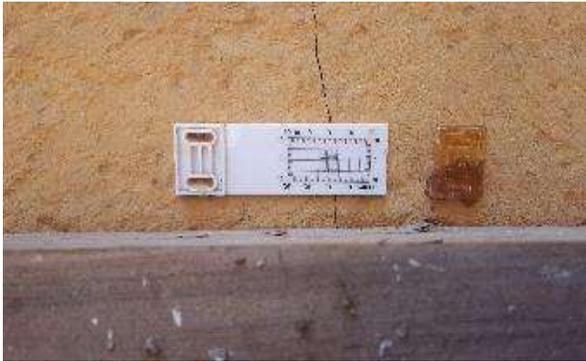
Damage Assessment

The site management staff carried out a detailed damage assessment for documentation and ascertaining the nature and scope of damage. From the outset, it appears that the suspect focused the graves whose stones were already cracked. There is no sign of breaking and it appears that he simply dislodged the gravestones and made them look like rubble. Following pictorial account gives a fair understanding of the damage. All desecrated graves are unknown. The pictures with the red arrows show the damage and the green arrows show the re-assembly (Anastylosis) of the grave stones.

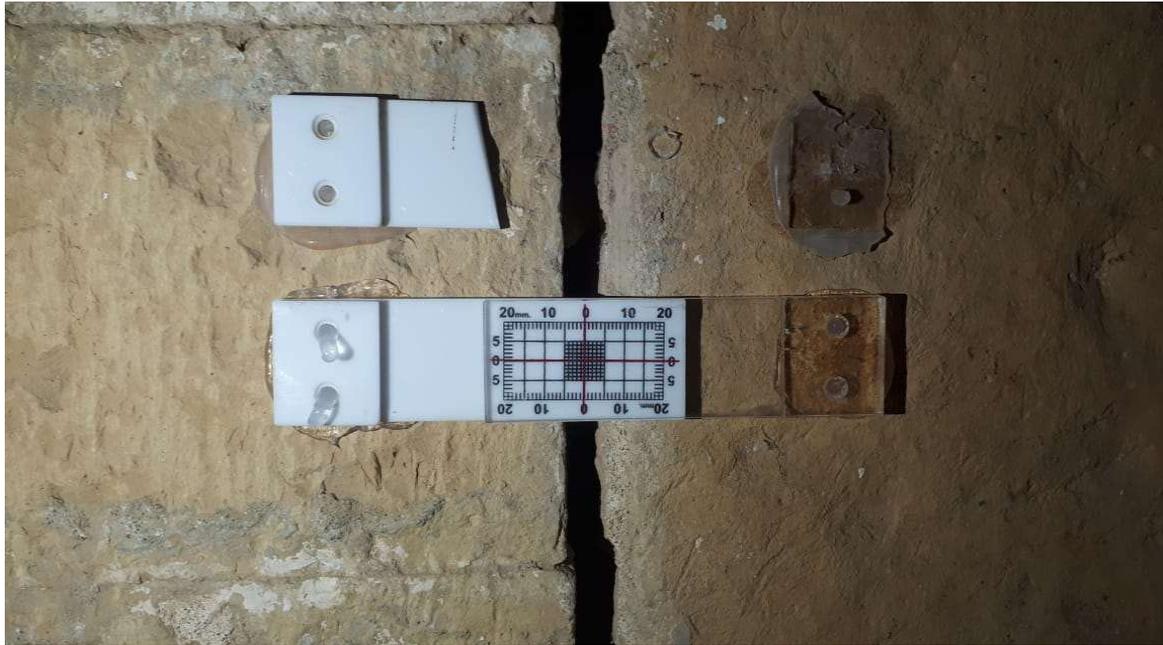




Broken Crack Monitors



Crack Monitors Re-installed



Actions Taken

Directorate of Antiquities and Archaeology took the following immediate actions after the incident;

1. An FIR (formal complaint) was lodged at the Police Station
2. The prime suspects are in custody and the matter is being investigated
3. A detailed damage assessment was carried out and documented using historic photographs
4. The dislodged grave stones were re-assembled (Anastylosis) to their original position
5. An urgent meeting of 'Makli Steering Committee' was called at the site on 3rd October, 2018 for assessing the situation and suggesting appropriate measures
6. Security at the Samma Cluster has been increased by hiring additional guards. The cluster is now guarded 24/7
7. Vehicular movement inside the site premises is stopped
8. The wooden door that was broken is repaired
9. New crack monitors have been re-installed
10. Cooperation with the police is underway
11. Work with the surrounding community is being undertaken. The motivations behind such an attack must be understood.

Photographs and Captions

Inventory system for displaced architectural elements

An inventory system was implemented in January 2017 with the drafting of a manual and a training exercise. This has been followed, where there have recently been some fallen materials at the tomb of Baki Beig. However, with the recently cleared brush from the site, many small tombs have been “rediscovered.” These have been documented, and through anastylosis, the individual stones of the tombs have been repositioned. This is mainly possible given the dry lay stone construction. However, the documentation must be improved and manually updated.



Figure 3 – Fallen decorative elements at the tomb of Baki Beig, included documentation before movement, the context, photography of the decorative surface, numbering and storage in the central office.





Figure 4 – Repositioned stones in the tombs after clearing the brush, west of the tomb of Sultan Quas. It should be noted that the inventory photo documentation of this type is being captured before, during, and after this process.

Documentation of the remaining architectural elements – glazed tile

An inventory and documentation were conducted by the Heritage Foundation Pakistan, and this included the type and location of the glazed tile. This inventory documented the buildings with significant remaining portions of glazed tile along with photographs, maps, and dimensions. But this inventory was created to analyze the tile and not as a complete inventory. There are many other buildings with minor pieces of remaining tile, and these were investigated in 2018. There are also many other minor tombs with small remaining glazed tiles and decorative stone work thus more work is required. This inventory and training will be continued during the October 2018 session.

REVIVAL OF ANCIENT KASHI IN SINDH

KASHI TILES SAMPLE DIRECTORY		WHS, MAKLI
IIF National Register No.	Monument Type	Makli Necropolis at World Heritage Site Thatta
3Q2-03	FUNERARY ENCLOSURE	TOMB OF SULTAN IBRAHIM

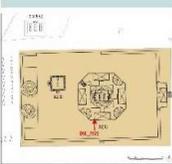


Image No. IFR_2792

SAMPLE NO.	GPS LOCATION
MA-01	N 25 31' 21.23" E 68 37' 03.64"
SAMPLE DETAILS	
Size	65 x 80 mm
Thickness of tile	24 mm
Color of Clay	Turquoise, Blue, White
Design	Focal Pattern
SAMPLE DESCRIPTION	
<p>It is a rectangular border tile that runs around the Kashi work within all four quadrants on the facade of the tomb of Sultan Ibrahim. It consists of an intricate focal pattern made with turquoise, blue and white glaze.</p> <p>This loose sample was found at the southern end of the Tomb of Sultan Ibrahim.</p>	



Image No. IFR_2877



Site Plan with the location of the loose sample



Image No. IFR_0851



Image No. IFR_0857



Image No. IFR_0854

Scene filing and identification of samples by: Naveed Islam Saifi & Dr. Arif Ullah Akmal

Figure 5 – Sample of the inventory undertaken by the Heritage Foundation. This will serve as a model and format to continue work on the minor tombs with glazed tile and decorative stone-carved elements.



Figure 6 – Extant tile investigation and inspection at an Unknown Tomb east of Sultan Ibrahim

Record and analyze data from the weather stations

All three weather stations are collecting data on wind direction and speed, rainfall, temperature, and humidity, etc. The data has been collected for the months of November, December, and January. These weather stations were installed in January 2017 and were operational however the data loggers/recorders were not available. The data loggers are now installed, and operational along with a new laptop purchased to download and analyze the data. Experts came three times over November 2017 and conducted training sessions on the hardware and software. The reports are printed in hardcopy and placed into a binder within the Documentation Centre.

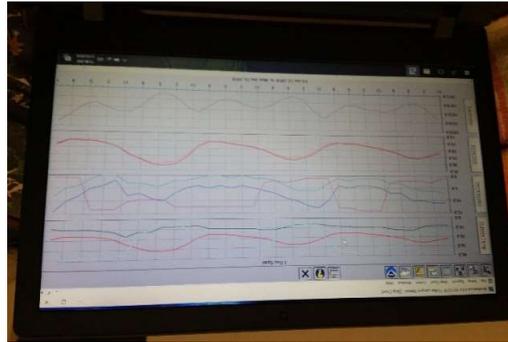
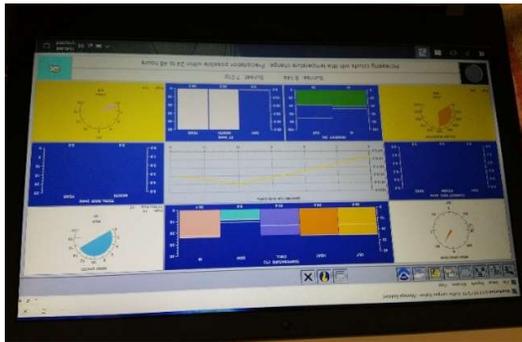


Figure 7 – weather station screen readout

Figure 8 – The weather station data loggers have been installed and are functioning

Figure 9 – data can be displayed in a variety of forms and has been logged for November, December 2017 and January 2018.

Record and analyze data from crack monitors

15 monitors were installed in 5 monuments and checked once per month. Initially, no changes have been recorded therefore it was determined that once per quarter would be sufficient. However, there are several broken crack monitors, especially at Jam Nizzamuddin. These must be replaced with higher quality Avongard brand monitors that are more resistive to UV sunlight. Also for an important monument such as Jam Nizzamuddin vibrating wire strain crack monitors with an accuracy of .01mm must be investigated especially if subsoil interventions works are carried out. This would allow continual monitoring of any drilling or conservation works.

Monument Name : ESSA KHAN (II)
 Date Of Installation : 20-12-2016
 No Of Tale Tells :3 Nos
 Location : IST AND 2ND FLOOR
 NO CHANGE (NC)

TABLE

S NO	JAN	FEB	MARCH	APRIL	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC
2017	04			01			y			01		
1	NC			NC			NC			NC		
2	NC			NC			NC			DAMA GE NC		
3	NC			NC			NC			NC		
4												
5												
6												
7												
8												
9												
10												

Figure 10 – Crack monitor recording sheet, there have been no changes over the past three year



Figure 11 – Crack monitors installed at Jam Nizzamuddin, unfortunately, the existing glass crack monitors of uncertain date (but before 1980) were broken or removed

Finalize the Management Plan

The Master Plan (with parts of a Management Plan) has been finalized and delivered to the site management office, Department of Antiquities, and the World Heritage Centre. It is being studied for content and areas of improvement. It is ambitious and contains long-term plans for visitor services such as an interpretation center, restaurant, hotel, and site presentation as well as a management plan for conservation. It must be improved in the area of conservation and should include short and medium term conservation projects. It could also be improved with greater depth in condition assessment and prioritization of interventions. In addition, it is only provided in hard copy without access to the digital files: AutoCAD drawings of the tombs, survey, photography, or satellite image. The digital files must be delivered as they are very useful on site. Nevertheless, it is a beginning and a base upon which to build.



Figure 12 – The extensive six-volume master plan has been delivered to the site office, Department of Antiquities and the World Heritage Centre.

One key aspect that must be included in the Management Plan is the use of active shrines on the site. In early 2017, 12 active shrines were visited, however, after further inspection, an additional 8 active shrines were located for a total of 20 active shrines. This has an enormous impact on the site as thousands of visitors enter the site daily.

Stabilization of all elements in danger of collapse

Stabilization efforts have been completed at 30 monuments including interventions ranging from emergency measures, cleaning, and drainage to more involved masonry stabilization. The works carried out are listed in greater detail later in this report.

Accommodating new burials

There have been new unauthorized burials detected in the last year. Usually these occur at night. These occurrences have been greatly reduced largely due to increased security, repair of lighting, and talks with the community. But it is difficult given that the surrounding community still wishes to bury their leaders within Makli and see it as a sacred place. There are also observed new burials "outside" the western foundation of the boundary wall. But this is still somewhat within the site but outside the planned boundary wall. This area has been toured by the authorities, but it still is not officially authorized. This legal process is taking time.



Figure 13 – Three areas at the western boundary of the site have seen recent burials, while these are within the site boundaries there is no evidence of archaeological remains. These areas have yet to be approved by the Department of Health.

Establish clear standards and mechanisms for interventions

This is in the process and was the subject of a recent training initiative conducted in January 2018. A draft Conservation Philosophy document is being developed as well as a system for interventions that are based upon the Nara Grid³ analyzing the values of the various monuments with an additional column that relates to the available budget. This Conservation Philosophy will reference to international standards and will be improved after the site manager's training at ICCROM in early 2018. This work must be continued in the fall of 2018.

Develop a process for the prioritization of work

This is also in process and includes a balance between severity of the condition, significance of the monument, other priorities, and budget available. This work must continue in 2018.

Extensive baseline photographic documentation

The master plan includes a detailed inventory of maps, drawings and photographs of the major tombs, monuments, platforms and a brief condition assessment. There could be an improvement, and this will be conducted with more significant monuments that are at risk. The master plan includes a detailed inventory of maps, drawings and photographs of the major tombs, monuments, platforms and a brief condition assessment of each. There could be an improvement, and this will be conducted with more significant monuments that are at risk and being evaluated for conservation. The inventory conducted by the University of Aachen is of a broad scale for the entire region and thus not appropriate for site management. A proper Geographic Information System (GIS) of all the major tombs, monuments, platforms and a brief condition assessment of each must be included.

³ Nara Grid and evaluation Scheme based on the Nara Document by Koen Van Balen

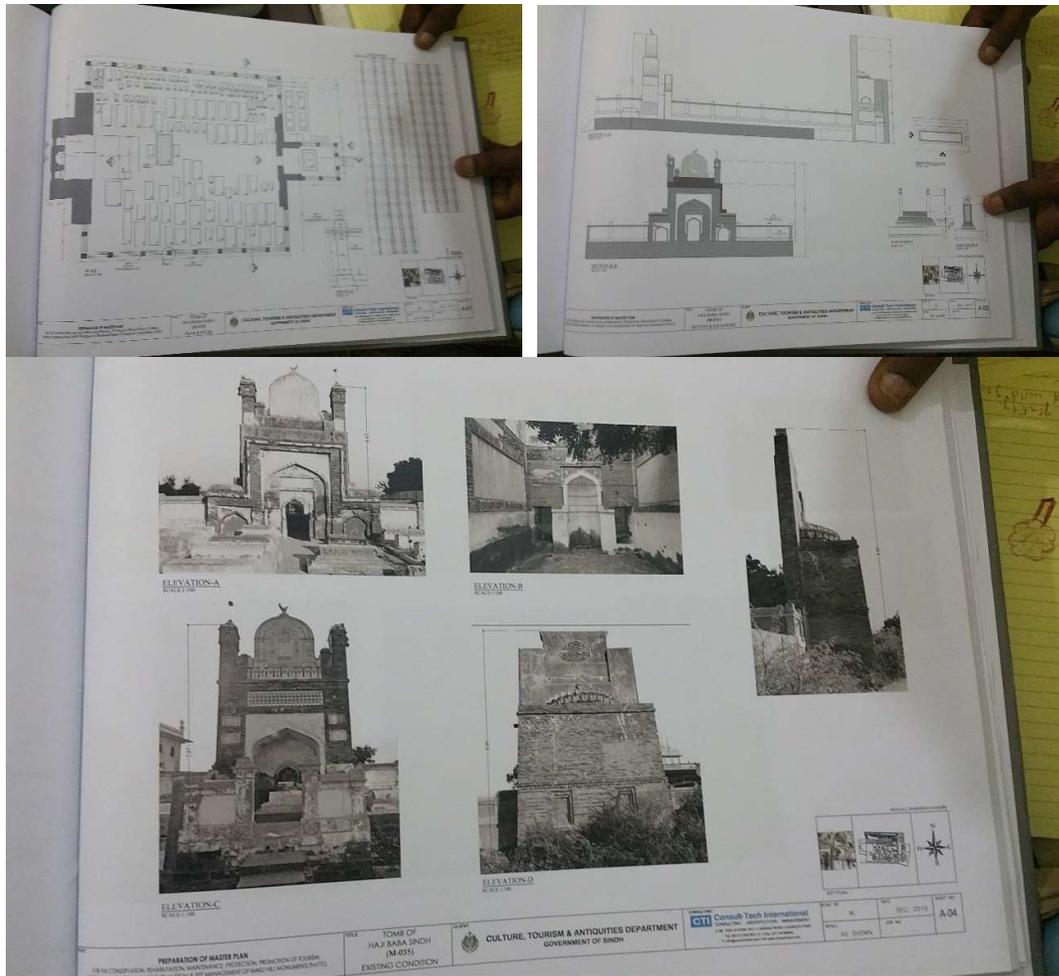


Figure 14 – Three pages from the management plan that have recorded the baseline of all the major tombs. This includes plans, key plans, elevations, basic dimensions, and photographs.

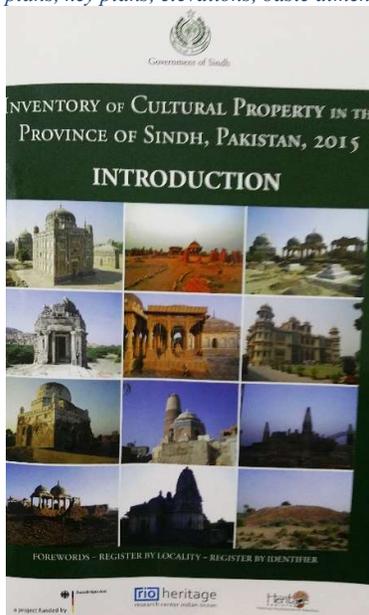


Figure 15 – The Inventory of Cultural Property conducted by the University of Aachen and funded by the German Government. The site manager and librarian currently have a copy of this inventory on site and in digital form but only PDF. The digital documents must be provided.

Provide short- and mid-term training programmes

Capacity building sessions were held in January 2017, January 2018 and are being planned in October/November 2018. These were held with the site manager and staff and included conservation philosophy, materials, documentation, and inventories of fallen original fabric. The site manager is attending the ICCROM Stone Course⁴ from March-May 2018 (originally planned for Nov. 2017 but canceled due to the earthquake in Mexico City). ICCROM provided a partial scholarship, and the site manager will make an application to ICOMOS Pakistan for travel funding. The site manager will also make an application to ICOMOS for travel funding to the ICOMOS General Assembly in Australia in 2020. The site manager will also join ICOMOS Pakistan and seek advice from local members. Training (three sessions) was also held in October 2017 on the use of the weather stations and analysis of the data. Also a list is currently being developed including distance learning and available courses and possible sponsorship/scholarship. This was discussed at length on site with the managers and directors. This will aid greatly in continuing to develop and refine the site guidelines for conservation. It is important to mention that the site manager underwent training on the conservation of archaeological artifacts at EVEHA, Poitiers, France recently. This included the conservation of wood, metal, and stone.

Finally, the First International Conference at Makli was recently held for three days in January 2018 and included many international experts in attendance. This also provided an educational experience for the on-site staff.

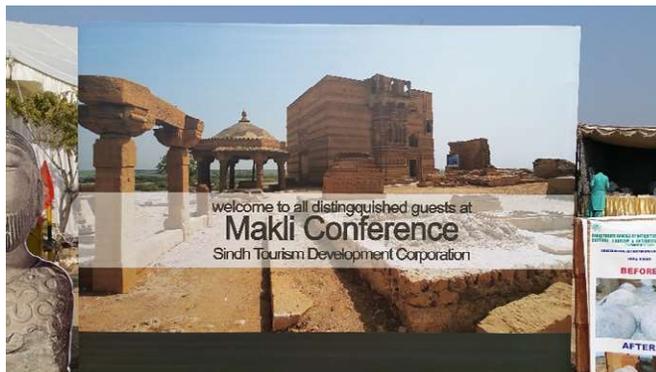


Figure 16 – Images from the First International Conference on Makli.

Items from the Reactive Monitoring Mission/Overall Management Litter collection

There is great improvement since 2016 with the prevention of unauthorized vehicular access and picnics. Rubbish bins were installed, and there is regular pick-up. However, this will continue to be a challenge as the site is still heavily used with most litter near active shrines and rubbish that blows in from off-site. Rubbish within the monuments has also been largely eliminated as many monuments now have new doors and are kept locked.

Trash removal has been a large project yet one of the easier aspects to implement on site. While it does not directly relate to conservation, nevertheless, it is an important part of improving site appearance. This has been a multistep approach including:

- a) Observation of problem areas and the purchase and installation of trash receptacles to these areas

⁴ <https://www.iccrom.org/courses/20th-international-course-stone-conservation-sc17>

- b) Purchase of a truck and establishment of a routine to empty the receptacles,
- c) Cleaning of the site of existing litter and vegetation
- d) Discussions with those responsible for regularly used shrines to keep the area free from rubbish. This will take additional time to change the current habits.
- e) Graffiti removal from monuments. There has been a significant reduction in the amount of graffiti from 2017 to 2018. This can be attributed to the increased security, repaired lighting and “broken window theory.”

This began with observation, purchase, and installation of trash receptacles. Over 40 of these have been installed at key location throughout the site including the pedestrian entrances, vehicular entrances, areas where people eat or purchase items, the more visited monuments and at active shrines. 20 of the receptacles have been kept in reserve to deploy once sufficient continuing observations have been made as to continuing trouble spots. While these are not exactly unobtrusive, their bright color attracts attention, and they are easy to unload and keep the trash away from animals and dry. They also have attracted attention notifying visitors that they should be used to keep Makli clean. In order to keep the receptacles empty a small truck was purchased and makes the rounds of all areas daily. The trash is removed off site to a landfill owned by the Department located approximately 2 kilometers away.

Site security

Site security has greatly increased at the site. Guards are posted at every major group, and the lighting has been reconditioned in Groups C & B. Security has also been improved given the greater control over unauthorized access with the three main gates to the south locked with private vehicles not allowed to enter. There is still some unauthorized access by vehicles from the north (see boundary wall section). However, private vehicle access is greatly reduced. Pedestrian access is still permitted at the two gates to the south. Motorcycle access is still permitted however this will be phased out in 2018. With any site as active and extensive as Makli security is a major issue. This has been exacerbated by limited mobility on the site. Many areas were too difficult to reach with the one 4 x 4 available to the site manager. Security guards were often on foot in 40+ degrees. Therefore the Department of Antiquities purchased four motorcycles to be used exclusively for the security patrols. A schedule within the provisional management plan will outline their schedule and inspection routine. Also the current office facilities and living quarters for the site manager are being renovated. This includes access to fresh water and two new cisterns for back up water, bathing and cooking facilities, and electricity. The main entry has been closed, and the only official access now is through this complex, and this should aid with security. Currently, the public knows of this access, and it is estimated that 90% of all vehicular traffic enters by the site manager’s office. Finally, the lights have been reconditioned in Groups B and C. These are in operation every night except the evenings with load shedding.

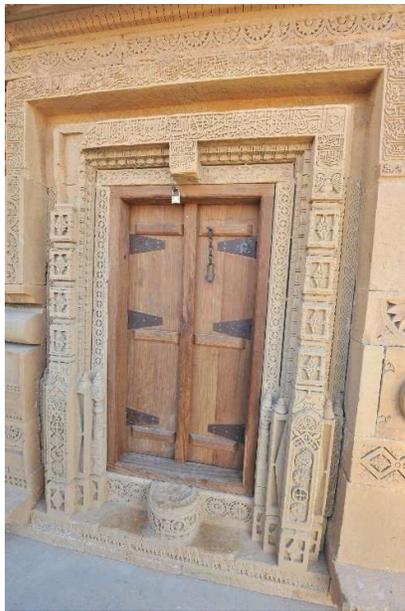


Figure 17 – the new door at Jam Nizamuddin prevents unauthorized entry – many of these new wood doors have been installed throughout the site



Figure 18 – blocked access from the south to the shrine Abdullah Shah Ashabi

One key element of security that has been implemented in 2017 is the blockage of the south access into an area of tombs near an active and popular Sufi shrine – Abdullah Shah Ashabi. This consists of two barriers to block vehicles coming from the south, an operable boom gate at the western approach, a 24-hour armed police presence, and checkpoint with a metal detector. These measures were implemented by Sindh police immediately after the suicide bomb attack in February 2017 at the shrine of Sufi saint Lal Shahbaz Qalandar⁵.



Figure 19 – access security measures at the Abdullah Shah Ashabi shrine

Mechanism established for physical interventions

This topic was addressed specifically during the training in January 2018. The interventions currently underway are entering the end of the emergency phase, and there must be a mechanism in place to plan for the future. This has not yet occurred as the site management is still focused on emergency works however this will be addressed in Oct. / Nov. of 2018 and will be a guiding document that balances urgent needs with significance and available resources.

Establishment of documentation/inventory and monitoring

Better documentation is necessary for all of the monuments at Makli. During the autumn of 2016 and in January 2017 documentation was begun at the most urgent monuments. This involved the survey team of 4 professionals including a photographer from the Department of Antiquities. During three months they surveyed with total station 18 monuments. Thins included: the Lali Mosque, Meran Bai (Unknown), Mirza Baqui – Baigtur Kahbn, Mirza Tughral Gag Turkhan, the Canopy south of Jani Baig, Bara Dari, Mausoleum of Sultan Qous, Tomb of Jumman Jatti, Malik Rajpal, Jamia Masjid, Hamshera Fateh Khan.

⁵ <http://www.bbc.com/news/world-asia-38994318>

Figure 23 – a site visit to the archives of the National Museum in Karachi was made, and over 20 volumes of historic photography were discovered from the 1960-70s. Eventually, copies of these thousands of photographs must be digitized and stored at Makli.

Boundaries

Boundaries and buffer zone - Two new barrier walls have been erected, a gate and fence at the southern border of the site and a wall between the existing exterior wall and the District Health Office Thatta (Sindh Government). This has prevented access at the western boundary of all vehicles at this point. However, the barrier wall to the northwest remains unbuilt. The encroachment communities have been given 15 acres away from the site to settle, and many have agreed to move, however until they do it is an ongoing battle to finish the western barrier wall.



Figure 24 – A new short barrier wall was constructed to halt the illegal settlements and vehicular access to the west of the site



Figure 25 – A new barrier fence at the entry to the site

Encroachment

The encroachment can be divided into four parts.

- 1) At the south entrances, the encroachment consisted of vendors and caretakers of the shrines who had erected illegal and unsafe structures. **These have all been removed.** There were protests by the vendors and caretakers. Therefore, a meeting was held with these individuals. While not fully resolved there is no longer any encroachment at the entries.
- 2) Tent encroachments at the western boundary. **Six tent families have been relocated,** and the others have agreed to leave. There is substantial documentation on their agreement to leave.
- 3) The more permanent encroachment communities with more permanent structures have been given 15 acres away from the site to settle, and many have agreed to move. However, this is still an ongoing process. Each illegal structure has been given a number and entered into a database.

- 4) Commercial stalls to the center-east of the site. Several of these have been closed, and illegal construction stopped but it is an ongoing challenge, and the boundary of the site runs through the middle of the street. This is compounded by the active shrine just within the boundaries of the site which leads to substantial foot traffic, therefore a market.



Figure 26 – Removal of illegal encroaching structures



Figure 27 – Removal of illegal encroaching structures



Figure 28 – The new barrier wall has closed off vehicular access at one portion on the western side of the site. A number of illegal tent structures have been removed. While there are still some illegal tent structures, the government has set aside 15 acres, and they have agreed to move. The debris has been removed, and empty areas will be restored.



Figure 29 – Illegal encroachment structures have been removed at the entry to the site

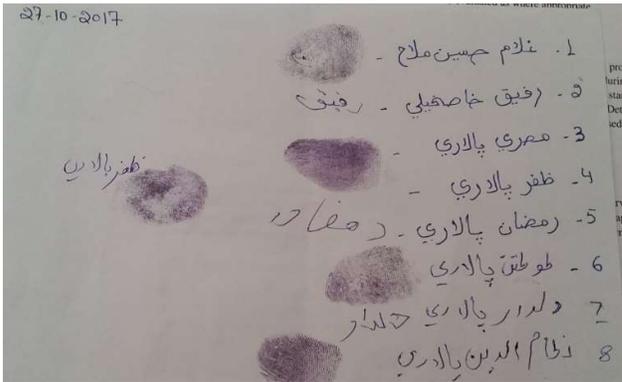


Figure 30 – Agreement by five people to move outside of the boundaries of Makli



Figure 31 – New wall at the western boundary of Makli, summer 2018



Figure 32 – (i) New wall at the western boundary of Makli, summer 2018 &



Figure 33 – (ii) Removing of encroachments, fall 2018

آفيس آف دي ايندمسٽريٽو مڪلي هيل مانومينٽس ٿاٽا
 بتاريخ - 2018-01-06
 نمبر/ڊي/ايج / E / 2018

جڙين ۽ اوهان جي اڪارٽ ۾ مڪلي ۾ ڦيرڻ
 جي زمين تي غير قانوني ڀنڀڻون ڪري رهيو آهيون
 آهن ميڪرو اينٽيڪٽ ڪيٽ 1975 تحت مهڙ جي نوسري ۾
 اچي ٿو ته هن ايڪٽ تحت ڪنهن به قسم جي اڌاوت - ڦهلو
 غير قانوني آهي - جڙين ۾ مڪلي ۾ آڻا ورڳڻ ڏيڻ
 لسٽ قرار ڏيڻ آهن - جنهن تي هڪ ڀيرو ما ٿيو - تنهن
 رسائيندو ته ان خلاف قانوني ڪارروائي ڪري -
 سگهجي ٿي -
 جنهن لاءِ اوهان کي هن نوٽيف ڏيڻي آڻا ٿوڪي ته
 اوهان پنهنجي ڀنڀڻون مڪلي ۾ سرڪاري زمين تان ڀڄي
 ڏيڻ ان رهنما تي ڪارروائي ڪري ٿو ته ان تي
 ڪارروائي ڪئي ويندي

M.D
 ADMINISTRATIVE OFFICER
 Makli Hill Monument
 THATTA.

سومر 29 آگسٽ 2016 ع
 روزانه ڪاوش حيدرآباد

مڪلي قبرستان ۾ قبضن خلاف آپريشن 300 ڪمپون اٿارٽون ڊاڪٽر

ڊرگاھ شاھ پريون پرسان اڏيل جهوپڙيون هٽايون ويون، پڪيڻ اٿارٽون برقرار
 بائرن ڏاٽي جاگير سمجهي قبضا ڪيا، ناچائڻ اٿارٽن کي هٽايو وڃي: سماجي اڳواڻ

نئون ان ڪا سنڌ جي قديم ۽ علمي ورثو جي حفاظت ڪندڙ اڳواڻن کي ڪاٺي پارڻ
 قرار ڏيڻ تاريخي ماڳ ۽ قبرستان مڪلي جي ضلعي انتظاميا کي ڏنل درخواست کانپوءِ
 گذريل ڪيترائي عرصي کان وٺي ٻائرن قبضا ڪندڙن اٿارٽن کي ڏيڻ
 ڪمپون پارڻ ڪيل غير قانوني اٿارٽن وارو ۽ انتهائي بي احتراميت پوليٽي مڪلي
 معاملو مڃيا ۽ اڃا ڪاٺي، تاريخي قبرستان پوليٽي ۽ انار ڏيڻ ۱0 ڪلور 7



مڪلي قبرستان قبضن خلاف آپريشن
 مڪلي قبرستان ۾ قبضن خلاف آپريشن ڪيو ويو. 300 ڪمپون اٿارٽون ڊاڪٽر
 ڊرگاھ شاھ پريون پرسان اڏيل جهوپڙيون هٽايون ويون، پڪيڻ اٿارٽون برقرار
 بائرن ڏاٽي جاگير سمجهي قبضا ڪيا، ناچائڻ اٿارٽن کي هٽايو وڃي: سماجي اڳواڻ

Figure 34 – Official notification accepted by occupier within Makli with signature

Figure 34 – news article of the public protest against moving businesses and other encroachments outside of Makli

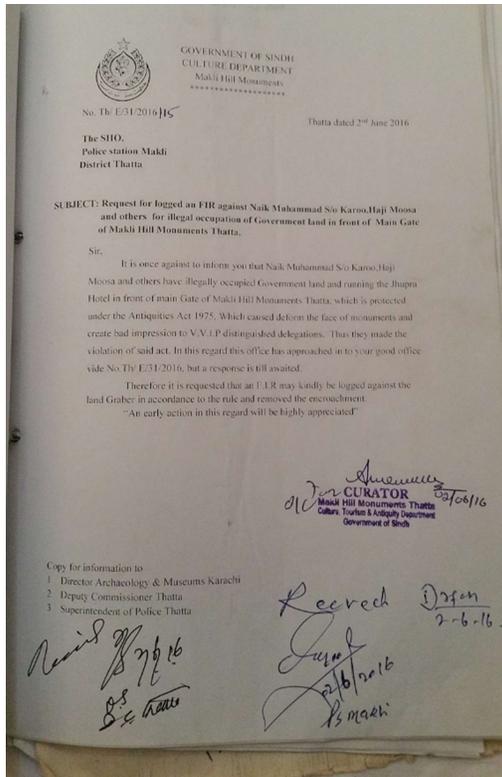


Figure 35 – Official notification delivered to every occupier within Makli



Figure 36 – Every illegal structure within the site has been numbered and entered into a database



Figure 37 – Illegal structures toward the center-east of the site. The boundary of the site runs through the center of the street of an active market. To the right is outside the boundaries to the left is inside the boundaries. Several stalls have been closed, but it is an ongoing challenge.

Visitor Services

Three electric shuttle buses have been purchased to deliver visitors throughout the site. These have been observed to be very popular with the visitors. There is one stationed at each of the southern entrances with a backup for distinguished guests, journalists, and government officials. There is a small fee charged for visitors to use the electric buses. The lack of cars on site (and their horns) and electric buses create a more peaceful, spiritual environment. There are plans to ban the motorcycles in 2018. There has also been a renovation of the original entry office in the south, and it has been converted into a gift shop with locally made products and publications about Makli and Sindh. There is also limited improved signage at the entries. Importantly, a fresh water pipe has been installed to the offices and guest house. A new visitor guide has also been published.



Figure 38 – Renovated gift shop at the entry to the site



Figure 39 – Electric buses have been purchased and are very popular with the visitors.



Figure 40 – A documentary video was produced for visitors and will be shown in the visitor center and is on-line (Department of Antiquities)

Visitor Survey

In January 2018, with greater control over site access, it was decided to conduct a visitor survey. It is important to management to understand the profile of the visitors to Makli, where they are coming from, and what they think of the site. A brief session was held to develop a visitor survey form to answer these questions. Architect Mushtaq Ali was tasked to conduct this visitor survey in the upcoming months.

Date	Name	Designation	Remarks and Signature
15-9-64	Rana Abdul Hamid	Agriculture & Food Minister Pakistan.	<p>Chilla Aiz... 15.9.64</p>
8-12-64	E. Akc	President of Turkey's Ever Azo Search	
8-12-1964	ayyemeral Muzaffer Huskup turkey. senator		
	Charahmet Ali Ozytoy turkize		
3/1/1965	Agam ditta Pun Pandy	Vice President of International Council of Iran Bagdad, Thailand	We are most impressed by what we have seen here. Good luck to you in your great work.
	1/1/65? Prem Pundit, bangla		

Figure 41 – the site manager has recovered the historic visitor books and will reinitiate this in 2018 (Serfraz Nawaz)

Individual Monuments, Photographs and Captions

Mubarak Khan

The floor of this open tomb was cleaned with rubbish and vegetation removed. This cleaning lowered the level and made the tomb more accessible. The scuppers were cleaned, and now there is positive drainage. New doors with locks were installed and the tomb closed unless by appointment. The main platform was conserved with loose stones secured and the installation of new compatible stones with lime mortar. New signage was installed. It must also be noted that the areas around this grouping of tombs have been cleaned and lines of lime washed rocks placed to prevent vehicles from coming close to the tombs.



Figure 42 – Mubarak Khan – cleaned with positive drainage, platform consolidation, and clean scupper inspection



Figure 43 – Area around Samma group has been cleaned and vehicles prevented from coming close to the monuments

Old Jamia Mosque

There was underpinning with compatible brick and lime mortar of eroded base of the walls both inside and outside. The extant plaster was edged to prevent water infiltration behind. However this was too pronounced and of an off-white color. A discussion was held to spend the time to mix with brick dust and test samples for color matching and texture. The monument was cleaned inside and out, and there was the removal of portland cement at the north façade. The buttress at the southeast corner stair was restored as it is structurally necessary. This small restoration followed the historic photographs which were found on site. It was also discussed that the repointing of the brick could also be neater. New notice boards were also added, and wasps cleaned out of the structure. This structure must undergo extensive structural evaluation, but the above measures were within the current capacity of the on-site staff.

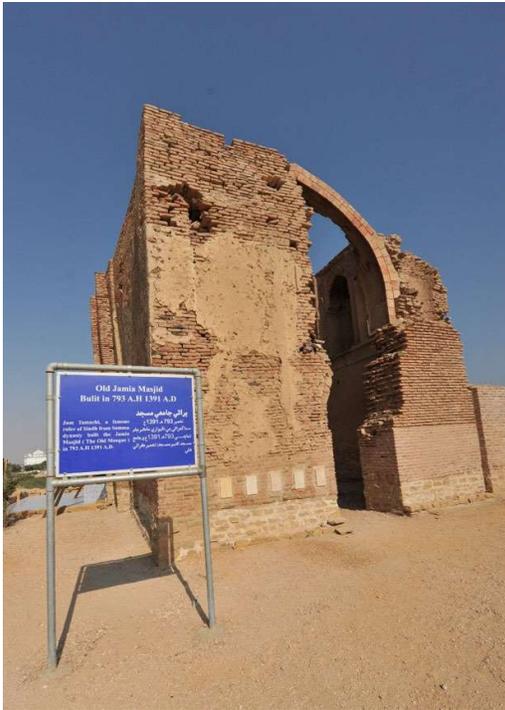


Figure 44 – Old Jamia Mosque with new sign board and plaster edging

Sultan Qaus

Structural stabilization of the remaining portions of the dome and wall capping to prevent the infiltration of water. The lime mortar used was whitish in color, and there were discussions to reduce the visual impact. This coloration was a minor issue as it is only seen from the top of the structure. Also new security doors were installed, and the roof access stairway stabilized and in one portion rebuilt as it acted as a buttress. There is historic plaster in the structure, and the topic of injection behind this plaster to re-attach the plaster to brick was discussed. This tomb, along with the others in this group, were cleaned of wasps which were a hazard to visitors. There must still be work to improve drainage within the tomb as the dome has been lost.



Figure 45 – Emergency stabilization of the upper wall surfaces of Sultan Qaus and the restored corner near the stair. The masonry work is acceptable and followed a historic photograph found in the office on-site

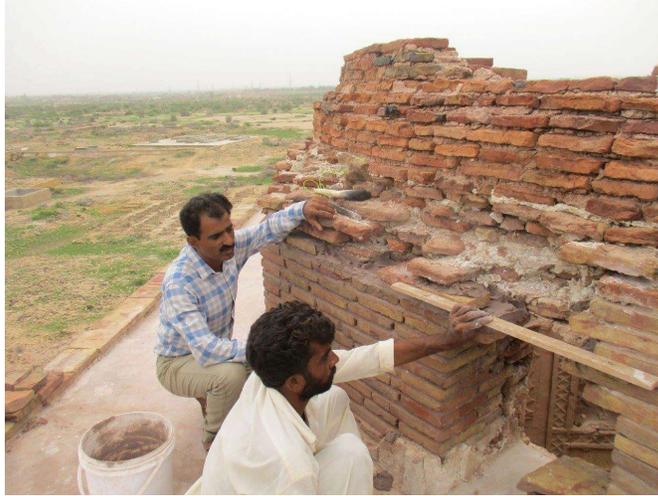


Figure 46 – Work at the dome remains at Sultan Qaus (Serfraz Nawaz) The masonry is now stable, and water infiltration has been prevented into the walls, but the historic plaster remains to be consolidated.

Hamshera Fateh Khan

A project has been prepared for this tomb including a condition assessment, drawings and photographs and a bill of quantity. However, in 2017, the conservation budget was exhausted. However general cleaning in and around the tomb was conducted. New signage was installed. It is estimated that 2 stone carvers, 2 masons, 1 carpenter, 4 helpers and 5 workmen are needed on site full time to continuously conduct conservation operations.



Figure 47 – Fatah Kahn and the entire area around the Samma Group has been kept clean of rubbish and vegetation. Rocks have been painted with lime and line the road to discourage parking near the tombs.

Mirza Tughral Baig

Crack monitors were installed and are being observed. Currently, there is no movement. General cleaning and vegetation removal were conducted in and around the monument. Drainage is also being monitored.

Juman Jatti

This tomb has undergone cleaning, brick and stone consolidation and wall capping. There was archival research also undertaken with the discovery of historic images from the mid-20th century. However, additional work must be undertaken after more in-depth studies.



Figure 48 – Juman Jatti tomb



Figure 49 – Brick corner reinforcement

Unknown Tomb (Sunjo Qubo)



Figure 50 – Work on site to stabilize the corner of this minor tomb platform

Structural stabilization of the platform of this minor tomb and removal of wild growth. While not as significant as other tombs it was relatively easy to address as work crews were nearby and there was ample material. It is also near the road thus seen by many visitors.



Figure 51 – Stabilization work on the unknown tomb platform

Jani Baig

New wooden doors with new locks for security and a new sign board were installed. There was general cleaning in and around the site.

Arghun Mosque

General cleaning and stabilization of small portions.

Meran Bai

The corner of this was consolidated, the fallen tile cataloged and stored. There was an issue with salt efflorescence after the consolidation work, so the new materials were cleaned several times with a natural bristle brush and clean water. The corner was then given a light lime wash to reduce the impact of the new materials. The salt efflorescence has not returned.

Shaikh Geo

This active shrine and tomb have not had any conservation work as there has been a conflict with its active caretakers. The caretakers have been installing electrical cables and carrying out their own works including portland cement patching and incompatible painting. These works have occurred even after meetings between the site manager and the caretakers in 2016 and again in January 2017. Throughout 2017 the site manager has engaged with the caretakers and has sought legal action to enforce control over the work on this important monument. Since his actions, the electrical cables have been removed and works halted. There are no serious structural issues with the tomb, but minor issues must be addressed including stabilization of the upper portions of the masonry, plaster consolidation, and removal of inappropriate materials.



Figure 52 – Shaikh Geo as it appeared in January 2018. Notice the portland cement patching on the lower western façade. This area currently traps water and drainage will need to be addressed in the future.

Jan Baba

This was a project by the Heritage Foundation Pakistan and was completed with funding by the German Government. It is now in stable condition. Only one dome was the extent, and through an innovative, reversible technique two new bamboo domes which were plastered were installed to complete the visual impact of the monument and keep out rainwater. A new glass door was installed with the lock, but this was broken as of January 2018. The interior of the tomb and approach has been kept clean by the on-site staff.

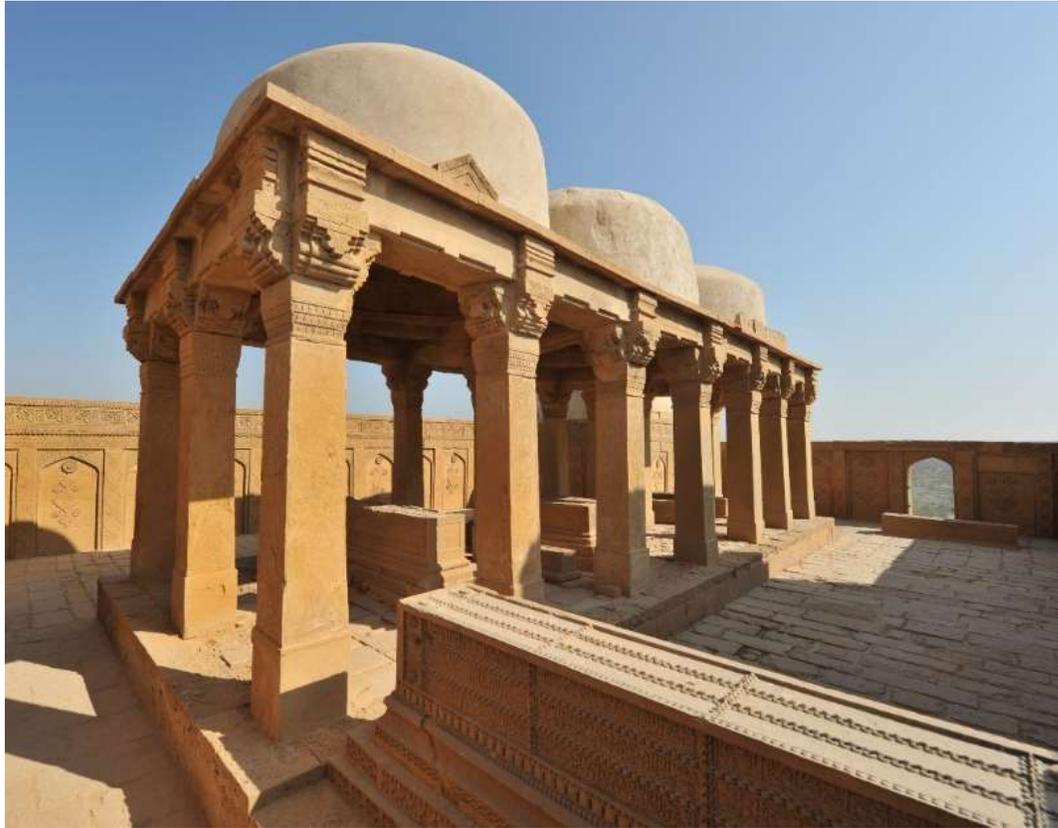


Figure 53 – the Recently finished tomb of Jan Baba... by Heritage Foundation Pakistan

Dewan-E-Shurfa

A project has been planned by the Endowment Fund Trust. The scope of this project remains unknown, and the site manager will officially request more information. Also some detached fallen tiles were detected, and these have been cataloged, photographed, and stored. The drainage below the dome was an issue, therefore, the scuppers were cleaned and a small course of compatible brick installed at the stair as water was entering the tomb from this stairway. New wood doors and locks were installed at the boundary wall and at each of the staircases. Crack monitors were installed at the southern portion of the roof and were monitored throughout 2017. There has not been any movement observed.



Figure 54 – Small brick course to direct surface flow water from entering the stair



Figure 55 – Before and after images of the repair to the parapet (Serfraz Nawaz)

Isa Khan Tarkhan II

This very significant tomb has structural deficiencies at the northwest corner. These are currently being monitored with the installation of crack monitors, and there has been no movement observed. However, there were collapses in the past sometime in the decade of the 1970s or 1990s. Beside seismic activity, it is thought that this is caused by the retention of rainwater on site and indeed there is a low lying area. The historic drains became blocked and had since been cleaned out. All are functioning with the exception of one at the northwest corner. A deposit of sculpted historic and replacement stone was deposited at this corner and prevents the historic drain from functioning. It was discussed that this would be move and the original pieces separated from the replacement pieces. This drain will then be cleaned again, and if necessary, an open drain will be created outside the boundary wall of the tomb to direct water away from the monument. This drainage channel could be installed to the north between the monument and asphalt road. It was discussed that this was important not to simply move the water to another tomb but that an absorption or evaporation pit could be created possibly in an existing lime pit used for the conservation of another tomb. In addition, there was significant graffiti on the outside boundary wall of this tomb. This graffiti has since been removed. The small domes have also been repaired.



Figure 56 – Cleaned historic drains at the tomb of Isa Kahn



Figure 57 – The exterior of Isa Kahn after the monsoon rains. Although the drains were cleaned out the water is still ponding to the north of the structure. Extensive discussions were held on draining this water to the east and using an open area as a percolation/evaporation pit.



Figure 58 – Before and after images of the work done to remove vegetation and waterproof the roof of Isa Khan before the monsoon (Serfraz Nawaz)

Mirza Baqui Bai Tur Khan

The platform conservation was completed, vegetation removed and new wooden doors with locks installed. A new notice board was installed. Stabilization of brick work and repointing occurred in early 2017 to stabilize the arches. The historic scuppers were cleaned, and the built-up earth area to the south outside the tomb was removed to provide drainage.



Figure 59 – The entire area around this tomb was cleaned and now water drains away from the structures to the right is the restored tomb platform (Serfraz Nawaz)



Figure 60 – Consolidation around the historic tile and repointing of the brick arch and restoration of the tomb platform (Serfraz Nawaz)

Lali Mosque

Extensive conservation works were carried out here in late 2016 and 2017. The remaining portions of the main dome and two walls were stabilized and the three smaller domes to the east stabilized. Several portions of the smaller domes required reconstruction in order to stabilize the remaining portions. Three large buttresses were constructed on the eastern (downhill) façade in order to stabilize the entire structure. These are massive and not in keeping with the original form of the building thus have come under criticism for their size when viewed from the east. This highlights a point for Jam Nizamuddin as the monuments should be seen from every vantage point and any intervention should not be overly intrusive. There were also discussions of grouting behind the remains of plaster and use of reinforcement ties and stitching of masonry cracks.

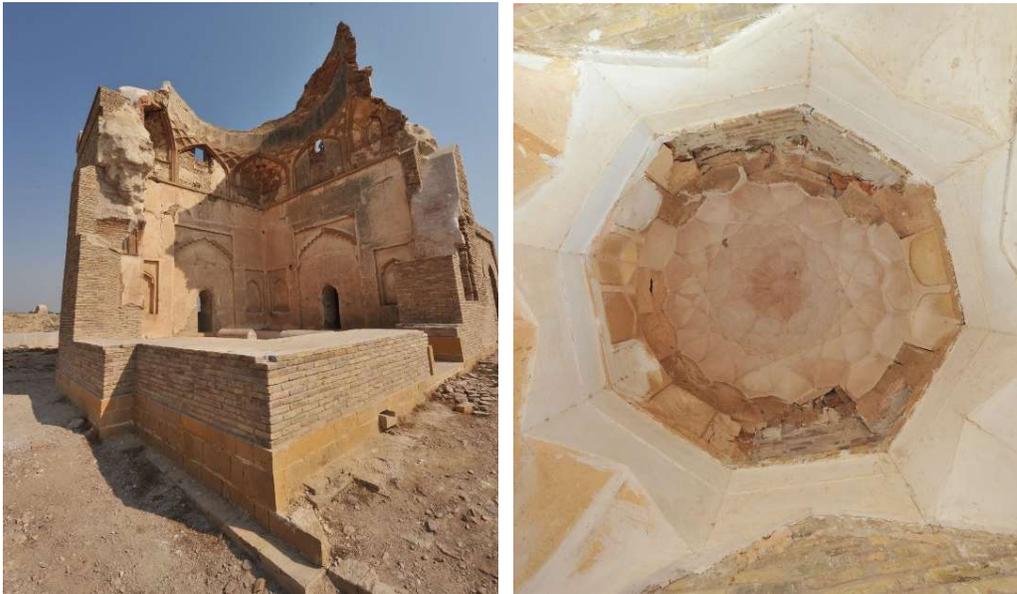


Figure 61 – Lali Mosque works including stabilization of the platform and interior tombs including stabilization of the interior of the plaster in the small domes



Figure 62 – Lali Mosque restoration of sections of the dome (Serfraz Nawaz)

Jumman Jatti, Bara Dari, Malik Rajpal, Doolah Diryakhan

General cleaning, brush removal, emergency stabilization, removal of bird droppings and notice boards and new wooden doors were installed at various monuments.



Figure 63 – New wooden doors installed for security at Doolah Diryakhan /Serfraz Nawaz)



Figure 64 – The cleaning and installation of signs have let the surrounding community know these monuments are being addressed and this has greatly reduced rubbish with no graffiti observed in January 2018. However, there are immediate issues that must be addressed



Figure 65 – the discovery of a new mosque while cleaning the site (Serfraz Nawaz)



Figure 66 – Unknown compound before and after cleaning and intervention (Serfraz Nawaz)

Canopy South of Jani Baig

General cleaning on the surrounding walls but there have not been any works on the canopy itself.



Figure 67 – Various smaller stabilization projects were conducted in this area

Ali Muhammad 1090 (previously unknown)

This small brick domed tomb has isolated some distance from the other tombs and has not yet been addressed for conservation needs. Therefore it was used a model to discuss the preparation a conservation project. Initial photography was captured along with dimensions and a rapid condition assessment. Discussions were held about the values and significance of the tomb, its condition, what measures should be taken. Some of these included urgent conservation of the one extant dome, fabrication of two lighter domes over the opening which were lost such as at Jan Baba. If the boundary walls should be restored and to what extent. Following this office exercises were held to rectify the images and develop drawings, bills of quantity and a trial specification. This project has been interrupted as the site manager is currently at ICCROM but will be the subject of a follow-up in late 2018.



Figure 68 – Ali Muhammad, east façade

Satcharni

This important tomb was stabilized in the 1990s, however, requires attention. It has been selected by the Heritage Foundation Pakistan for an upcoming conservation project. It was selected as it has important remains of decorative tile that require consolidation and protection from the weather. Also, the idea from Jan Baga of a lightweight reversible dome to keep out the rain and complete the profile is an interesting topic. Therefore only maintenance work, cleaning, brush removal and a new sign were the only work carried out in 2017.



Figure 69 – important extant tile is a defining element of Makli's Outstanding Universal Value

Unknown mosque

This is an important tomb but located to the east at the edge of the slope thus away from frequent visitors. It has numerous areas of extant decorative tiles. It is at risk from the instability of the slope and is open to the weather. This monument was visited in 2018 and options discussed for its stabilization. The Heritage Foundation Pakistan, following their work at Sultan Ibrahim, has received a grant from the Prince Claus Fund and has submitted a request to conserve this tomb. The site manager held a meeting with the Director General of Antiquities and encouraged this project but with the condition that the on-site staff is involved in preparing the project and monitoring the conservation work.



Figure 70 – substantial areas of glazed decorative tile adorn this tomb

Sultan Ibrahim Mausoleum, Completion of work

The non-profit foundation Heritage Foundation Pakistan has worked on numerous projects at Makli. (<http://www.heritagefoundationpak.org/mi/1/World-Heritage-Site--Thatta>) These include emergency work at the Tomb of Samma Nobil (Supported by the Prince Claus Fund), the Tomb of Jan Baba (Supported by the Federal Republic of Germany) and the Sultan Ibrahim Mausoleum (Supported by the US Ambassador's Fund for Cultural Heritage) and documentation including bore holes and geological studies at Jam Nizamuddin. Due to disagreements concerning the conservation approach the work was temporarily halted at the Mausoleum. This issue has since been resolved, and work has been permitted to proceed at this site. During January some limited work was observed at the Sultan Ibrahim Mausoleum that included repointing at the gate and two stone masons at the entry. A staff member, from the Department of Antiquities Government of Sindh, has been appointed to be the liaison with all work undertaken in collaboration with the Heritage Foundation. His assignment includes working on the teams from the Foundation and reporting to the site manager.

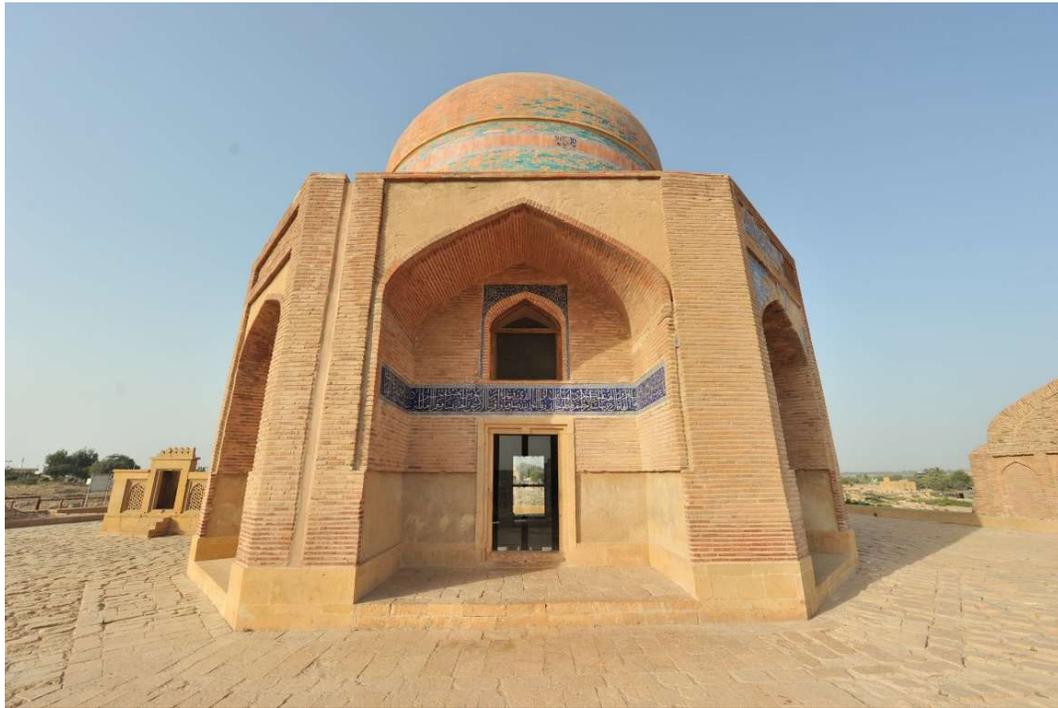


Figure 71 – the recently completed tomb of Sultan Ibrahim by the Heritage Foundation



Figure 72 – Aerial survey and 3D modeling of Jam Nizamuddin

List of Figures

Figure 2 –Makli is a living site with thousands of visitors (Eppich, 2017)	63
Figure 3 - of the more than 20 active shrines at Makli 1) Shah Abdul Karim Bukhari, 2) Junman Shah Jalali, 3) Fazal Shah Qadri, 4) Shah Parian (women’s shrine), 5) Abdulla Shah Asabi, 6) Shah Gudroon, 7) Shaikh Geo, 8) Bibi Shirin (near Shaikh Geo), 9) Mai Makli, 10) Jam Nizamuddin tomb, 11) Dulah Darya Khan, 12) Mula Lutter	63
Figure 3 – Fallen decorative elements at the tomb of Baki Beig, included documentation before movement, the context, photography of the decorative surface, numbering and storage in the central office.....	73
Figure 4 – Repositioned stones in the tombs after clearing the brush, west of the tomb of Sultan Quas. It should be noted that the inventory photo documentation of this type is being captured before, during, and after this process.	74
Figure 5 – Sample of the inventory undertaken by the Heritage Foundation. This will serve as a model and format to continue work on the minor tombs with glazed tile and decorative stone-carved elements.	74
Figure 6 – Extant tile investigation and inspection at an Unknown Tomb east of Sultan Ibrahim	75
Figure 7 – weather station screen readout	75
Figure 8 – The weather station data loggers have been installed and are functioning.....	75
Figure 9 – data can be displayed in a variety of forms and has been logged for November, December 2017 and January 2018.	75
Figure 10 – Crack monitor recording sheet, there have been no changes over the past three year	76
Figure 11 – Crack monitors installed at Jam Nizzamuddin, unfortunately, the existing glass crack monitors of uncertain date (but before 1980) were broken or removed	76
Figure 12 – The extensive six-volume master plan has been delivered to the site office, Department of Antiquities and the World Heritage Centre.....	77
Figure 13 – Three areas at the western boundary of the site have seen recent burials, while these are within the site boundaries there is no evidence of archaeological remains. These areas have yet to be approved by the Department of Health.	78
Figure 14 – Three pages from the management plan that have recorded the baseline of all the major tombs. This includes plans, key plans, elevations, basic dimensions, and photographs.	79
Figure 15 – The Inventory of Cultural Property conducted by the University of Aachen and funded by the German Government. The site manager and librarian currently have a copy of this inventory on site and in digital form but only PDF. The digital documents must be provided.	80
Figure 16 – Images from the First International Conference on Makli.	80
Figure 17 – the new door at Jam Nizzamuddin prevents unauthorized entry – many of these new wood doors have been installed throughout the site	82
Figure 18 – blocked access from the south to the shrine Abdullah Shah Ashabi	82
Figure 19 – access security measures at the Abdullah Shah Ashabi shrine	82
Figure 20 – Left - the physical location for the Documentation Centre has been established and a librarian assigned to populate the space with books, publications, and digital materials.	83
Figure 21 – Right, the condition assessment report and file established to monitor the more significant tombs	83
Figure 22 – A visit to the Library and Archives in Sindh revealed many historic publications and photographs of Makli	83
Figure 23 – a site visit to the archives of the National Museum in Karachi was made, and over 20 volumes of historic photography were discovered from the 1960-70s. Eventually, copies of these thousands of photographs must be digitized and stored at Makli.....	84
Figure 24 – A new short barrier wall was constructed to halt the illegal settlements and vehicular access to the west of the site	84
Figure 25 – A new barrier fence at the entry to the site	84
Figure 26 – Removal of illegal encroaching structures	85
Figure 27 – Removal of illegal encroaching structures	85
Figure 28 – The new barrier wall has closed off vehicular access at one portion on the western side of the site. A number of illegal tent structures have been removed. While there are still some illegal tent structures, the government has set aside 15 acres, and they have agreed to move. The debris has been removed, and empty areas will be restored.....	85
Figure 29 – Illegal encroachment structures have been removed at the entry to the site.....	86
Figure 30 – Agreement by five people to move outside of the boundaries of Makli	86
Figure 31 – New wall at the western boundary of Makli, summer 2018	86
Figure 32 – New wall at the western boundary of Makli, summer 2018	87
Figure 33 – Official notification accepted by occupier within Makli with signature	88
Figure 34 – news article of the public protest against moving businesses and other encroachments outside of Makli	88
Figure 35 – Official notification delivered to every occupier within Makli	89
Figure 36 – Every illegal structure within the site has been numbered and entered into a database	89
Figure 37 – Illegal structures toward the center-east of the site. The boundary of the site runs through the center of the street of an active market. To the right is outside the boundaries to the left is inside the boundaries. Several stalls have been closed, but it is an ongoing challenge.	90
Figure 38 – Renovated gift shop at the entry to the site	90
Figure 39 – Electric buses have been purchased and are very popular with the visitors.....	91
Figure 40 – A documentary video was produced for visitors and will be shown in the visitor center and is on-line (Department of Antiquities).....	91
Figure 41 – the site manager has recovered the historic visitor books and will reinstate this in 2018 (Serfraz Nawaz)	92

Figure 42 – Mubarak Khan – cleaned with positive drainage, platform consolidation, and clean scupper inspection	93
Figure 43 – Area around Samma group has been cleaned and vehicles prevented from coming close to the monuments	93
Figure 44 – Old Jamia Mosque with new sign board and plaster edging	94
Figure 45 – Emergency stabilization of the upper wall surfaces of Sultan Qaus and the restored corner near the stair. The masonry work is acceptable and followed a historic photograph found in the office on-site	94
Figure 46 – Work at the dome remains at Sultan Qaus (Serfraz Nawaz)The masonry is now stable, and water infiltration has been prevented into the walls, but the historic plaster remains to be consolidated.	95
Figure 47 – Fatah Kahn and the entire area around the Samma Group has been kept clean of rubbish and vegetation. Rocks have been painted with lime and line the road to discourage parking near the tombs.	95
Figure 48 – Juman Jatti tomb.....	96
Figure 49 – Brick corner reinforcement.....	96
Figure 50 – Work on site to stabilize the corner of this minor tomb platform	97
Figure 51 – Stabilization work on the unknown tomb platform.....	97
Figure 52 – Shaikh Geo as it appeared in January 2018. Notice the portland cement patching on the lower western façade. This area currently traps water and drainage will need to be addressed in the future.....	98
Figure 53 – the Recently finished tomb of Jan Baba... by Heritage Foundation Pakistan	99
Figure 54 – Small brick course to direct surface flow water from entering the stair	100
Figure 55 – Before and after images of the repair to the parapet (Serfraz Nawaz)	100
Figure 56 – Cleaned historic drains at the tomb of Isa Kahn.....	101
Figure 57 – The exterior of Isa Kahn after the monsoon rains. Although the drains were cleaned out the water is still ponding to the north of the structure. Extensive discussions were held on draining this water to the east and using an open area as a percolation/evaporation pit.	101
Figure 58 – Before and after images of the work done to remove vegetation and waterproof the roof of Isa Khan before the monsoon (Serfraz Nawaz).....	102
Figure 59 – The entire area around this tomb was cleaned and now water drains away from the structures to the right is the restored tomb platform (Serfraz Nawaz)	103
Figure 60 – Consolidation around the historic tile and repointing of the brick arch and restoration of the tomb platform (Serfraz Nawaz)	103
Figure 61 – Lali Mosque works including stabilization of the platform and interior tombs including stabilization of the interior of the plaster in the small domes	104
Figure 62 – Lali Mosque restoration of sections of the dome (Serfraz Nawaz).....	104
Figure 63 – New wooden doors installed for security at Doolah Diryakhan /Serfraz Nawaz)	105
Figure 64 – The cleaning and installation of signs have let the surrounding community know these monuments are being addressed and this has greatly reduced rubbish with no graffiti observed in January 2018. However, there are immediate issues that must be addressed.....	105
Figure 65 – the discovery of a new mosque while cleaning the site (Serfraz Nawaz).....	105
Figure 66 – Unknown compound before and after cleaning and intervention (Serfraz Nawaz)	106
Figure 67 – Various smaller stabilization projects were conducted in this area.....	106
Figure 68 – Ali Muhammad, east façade.....	107
Figure 69 – important extant tile is a defining element of Makli’s Outstanding Universal Value.....	108
Figure 70 – substantial areas of glazed decorative tile adorn this tomb.....	108
Figure 71 – the recently completed tomb of Sultan Ibrahim by the Heritage Foundation.....	109
Figure 72 – Aerial survey and 3D modeling of Jam Nizamuddin	110

Conservation Report Heritage Foundation Pakistan

Attached



*Culture, Tourism & Antiquities Department
Government of Sindh (Pakistan)*

November 28, 2018

We are proud of our recent accomplishments at Historical Monuments at Makli, Thatta. Protection of the Outstanding Universal Values has never been better. At risk significant monuments have been stabilized, others are being monitored, the site is more secure and clean with the removal of rubbish, wild vegetation, and graffiti, and numerous individual grave markers have been reassembled following a defined protocol of anastylosis. The site is also more peaceful for the thousands of visitors we host weekly. We have prohibited private cars, their horns, and random parking near ancient tombs. Visitors may still enter freely and their access to the large site is facilitated by three small sustainable electric buses. Illegal housing and business encroachments have been and are currently being removed following a resettlement program and for the first time in a generation many important tombs are visible. The boundary wall is also once again under construction, and the visitor's center and gift shop have been rehabilitated.

We are also striving to communicate the significance of Makli locally, regionally, and internationally. The Culture, Tourism and Antiquities Department recently hosted the First International Conference on Makli which was attended by international experts but more importantly by the local community. Academic papers were presented on the history, importance, and conservation of the site along with music, dance, and food. Over 7,000 people attended the three-day event.

We realize Makli has suffered for decades and have read the past decisions of the World Heritage Committee and the Reactive Monitoring Mission reports. But we firmly believe we have reversed this trend. The transfer of responsibilities for Makli to the Provincial Government of Sindh has had a positive outcome and impact on the site.

Of course, we must always be vigilant and there is much work that remains but we are up to the challenge. Therefore, we are proud to submit this State of Conservation report.

Sincerely,


(Manzoor Ahmed Kanasro)

Director General
Antiquities and Archaeology

Manzoor Ahmed Kanasro
Director General Antiquities
Culture, Tourism & Antiquities Deptt.
Government of Sindh

Executive Summary

Response to the Decisions of the World Heritage Committee - Within this SOC report are in-depth responses to each decision. This comprises actions successfully completed as well as actions currently ongoing. Completed activities include: an inventory system for displaced architectural elements, installation of weather stations and crack monitors, drafting of the management plan, stabilization of components in danger of collapse, capacity building of the staff, baseline documentation in drawings and photographs, and the submission of this report. There have been numerous conservation efforts at Makli including Jamia Masjid, Essa Khan II, Mubarak Khan, Old Jamia Mosque, Sultan Qaus, Hamshera Fateh Khan, Mirza Tughral Baig, Juman Jatti, Sunjo Qubo, Jani Baig, Arghun Mosque, Meran Bai, Jan Baba, Dewan-E-Shurfa, etc. Actions currently underway also include a detailed structural assessment and recommendations of the tomb of Jam Nizamuddin. This tomb must be addressed with the utmost caution as it is a complex and delicate structure as well as a defining structure of Makli. Thus we have begun in-depth studies, research, and have solicited numerous proposals for the stabilization of this monument. This tomb, as well as others are undergoing continual monitoring with the decisions of the Committee and Reactive Monitoring Mission as guidance.

Other current conservation issues with possible impacts on OUV - There are several ongoing issues not previously addressed. These consist of the living aspects of Makli; that it is used by thousands of people, as pilgrims and the local community on a weekly basis and there are 21 active shrines on the site, each with its own "caretaker." Therefore, a visitor plan and survey are being considered. Another issue is drainage and maintenance and the site team is actively working on a maintenance plan. Finally, a recent vandalism attack has occurred at the tomb of Jam Nizamuddin. While the perpetrator is in custody and the new security measures functioned, this event has been disappointing. A meeting of the Steering Committee was immediately convened and an independent consultant charged with investigating. Within the appendix of this report is our own assessment of the event.

Major restorations, alterations and new constructions - There have been numerous major conservation works at a number of significant tombs including Lali Mosque, Isa Khan Tarkhan II, and Jan Baba, Sultan Ibrahim, and recently begun works at Munir Maghfoori, including its decorative tiles (unknown before) by the Heritage Foundation. But there have also been numerous small restorations at less significant but still contributing historic tomb markers. As the site has been cleared of decades of vegetation these elements have been recovered. Alterations include the non-historic buildings on site: the refurbishment of the visitor center and gift shop, rehabilitation of the entry gates, and the structures that house the site office and residences, offices and documentation center. New construction includes key portions of the boundary wall, new gates and importantly, removal of commercial and residential encroachment on site.

Public access - In accordance with the policies of Government of Sindh and our current outreach efforts this report will be within the public domain. We are eager to share our recent accomplishments to protect Makli for future generations.

Appendix - Numerous additional documents are attached to this report to describe the state of conservation. These include the data analysis from the three installed weather stations, observation reports of the crack monitors installed at a number of monuments, structural report from an international expert engineer on Jam Nizamuddin and reports from the non-profit Heritage Foundation Pakistan, our partner on a number of conservation projects. This appendix also contains photographs.

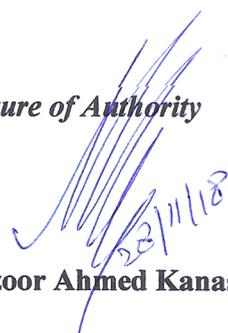
Manzoor Ahmed Kanasro
Director General Antiquities
Culture, Tourism & Antiquities Deptt
Government of Sindh

Signature of Authority

UPDATED STATE OF CONSERVATION REPORT ON HISTORICAL MONUMENTS AT MAKLI, THATTA SINDH (PAKISTAN) (C 143) DECISION: 41COM 7B.97

State party	Culture, Tourism & Antiquities Department Government of Sindh, Pakistan
Name of Property	Historical Monuments at Makli, Thatta (Pakistan) (C 143)
Criteria under which the property is inscribed (iii) of the World heritage Convention.	“Bears a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared”

Signature of Authority



(Manzoor Ahmed Kanasro)

Director General
Antiquities and Archaeology
Culture, Tourism and Antiquities
Department
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