Final Report

Academic Documentation of Restoration and Conservation of the Cenotaphs of Rana Amar Singh I and Rana Sangram Singh II at Mahasatyaji, Ahar, Udaipur

(October 2013 – March 2016)

Project Supported By
Shree EklingJi Trust , Udaipur, India
Maharana of Mewar Charitable Foundation, Udaipur, India
The Anthony Robbins Foundation, USA

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CONTENT :

SITE AND SURROUNDINGS

The concept of Cenotaph has always been a part of medieval Rajput towns. Memorial structures are found in the form of tombs, mausoleum or cenotaphs or chattris in the whole of rajputana or present day Rajasthan.

Ahar cenotaph complex is a unique complex built under the royal patronage of mewar dynasty in the memory of their forefathers. Located on the eastern side at a distance of 3 km from the walled city, the complex is a known archeological site. It offers remarkable facts about historic settlement through stratums of history with archeological and architectural remains. The surrounding settlement of the complex (Ahar settlement)carries three layers of history [Layer I –Ancient Ahar settlement, Tambavati Nagri (2500 BC), Layer II – Ahar or Aghatapur, earlier capital of Mewar (8th-13th century AD), Layer III – Udaipur (1553 AD)] covering over a period of more then 4000 years.

The cenotaph complex is also one of the largest cenotaph complexes among the other medieval rajput cenotaph complexes covering an area of 3.2 hectare with distinctive heritage components. Apart from being associated to funerary activity it also stood as important urban component, that was located outside the main settlement in the downstream landscape of the town.

The sacred linkage of the complex to the holy kund (Gangod Bhava Kund), the Shiv Parvati Temple and the association to the funerary ritual of the Mewar Dynasty gives the place a sense of association. The Gangod Bhava Kund and the Temple of Shiva carries a very sacred value and historically was the place of pilgrimage for the Mewar region. The religious and memorial linkages makes Ahar complex a very significant heritage component of the medieval Udaipur town.

Fig 1 : View of different Layers of Skyline of the city. Layer 1: Cenotaph Complex, Layer II: Archaeological Mounds, Layer III : Urbanization in the city

The complex comprises of three hundred and nineteen Chattri (amongst which the most prominent are the twenty one cenotaphs of the Rana's and Maharana's) is in itself a representation of a gradual evolution in the construction style within Mewar region.
Distinct in its architectural style it possesses high associational value making it a significant site of Living Heritage in present day context.

The complex has various structures, used by people for different purpose and is in custodianship of various stakeholder today faces a challenge of conservation management and maintenance. Due to its association with funerary activities the complex has always been ignored as a significant heritage component of a historic town, and has not been considered in the conservation process.

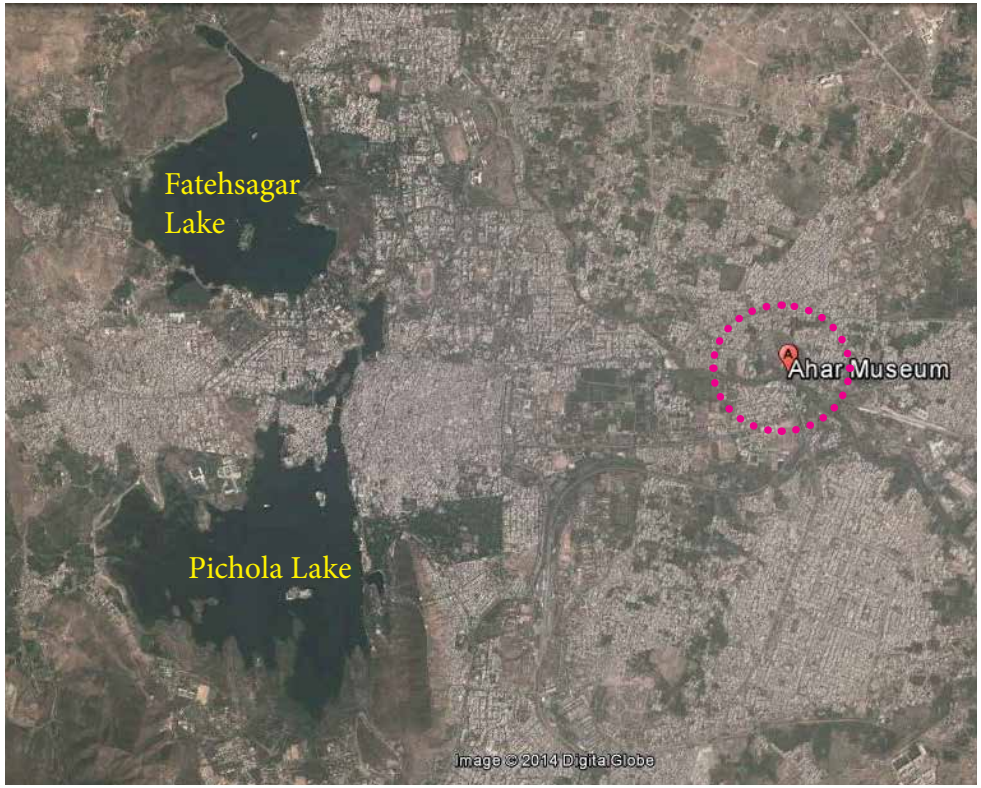


Fig 2: Map showing the distance of MahaSatya Ji cenotaph complex from Walled City

1.2 - PROJECT BACKGROUND

Considered as a sustainable tool for protection of its resources, Heritage Management is valued as an evolving vehicle for conservation of the natural, cultural and architectural heritage.

Within the integral framework of the "Conservation Management Plan for Ahar Cenotaph complex", The Maharana of Mewar Charittable Foundation, Udaipur has taken up the onus of conserving and documenting the work of cenotaphs [Rana Amar Singh I(r.1597 – 1620 AD) and Rana Sangram Singh II(r.1710 -1734 AD)], one of the oldest Chattri's in the complex.
The work not only includes conserving these cenotaphs but also training students of architecture to observe, participate and learn the art of conservation of historical buildings .
The objective behind inviting these students, historians and research scholars is to educate the future generations about conservation so that one can preserve precious works of architecture in the long run.
Nirnik has been associated with the project from its inception (August 2013 till August 2015 in furtherance to which the site supervision was taken care by MMCF in house team. Individual monthly reports have been submitted documenting the monthly progress.

Fig 3: View of the complex from Rana Sangram Singh I Chattri

OBJECTIVES

The objective of the report is to have a comprehensive compilation of the monthly report which includes
1. Conservation of the cenotaphs of Rana Amar Singh I and Rana Sangram Singh II, as they are an important part of the culture and architectural heritage of Mewar.
2. Student Training Program
3. Workshops

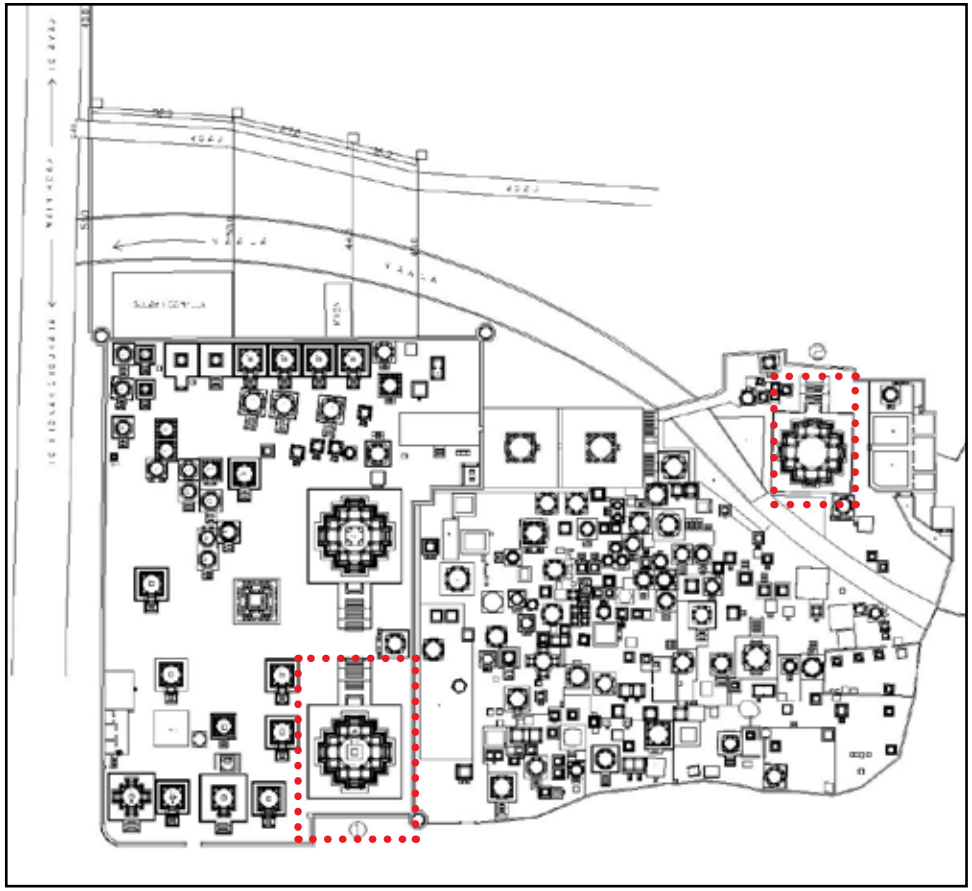
1.3 - PROJECT AREA

The Chattri or the cenotaph is generally constructed with stone and lime as primary building material. The structure is built as a Column beam load distribution system. The ahar cenotaph complex covers an area of 3.2 ha with chattris of maharanas, ranis and nobels. Out of 319 chattris two significant chattris are considered for restorationin the first phase.

Conservation and Restoration of Rana Amar Singh I and Rana Sangram Singh II Chattri

The Rana Amar Singh I(r.1597 – 1620 AD) is the oldest chattri in the complex with a unique architectural style.Built in stone and lime the structure faces challenges of growing urbanism and is in delapidated condition and requires immediate action of restoration.(Ref Fig : 5b)

The Chattri of Rana Sangram Singh II(r.1710 -1734 AD) is amongst the largest chattri in the complex. The Chattri comprises of 36 pillars on which rests the dome cladded in stone. (Ref Fig : 6b)



Base map source : MMCF

Fig 4 : Site Plan of the complex marked with the project area in red

RANA AMAR SINGH I (March 16, 1559-d. January 26, 1620)

Rana Amar Singh I was the fifty-fifth ruler of the Mewar Dynasty (r. 1597-1620); eldest of son of Rana Pratap. He succeeded his father, on January 19, 1597 at Chavand at the age of 38, and ruled for twenty-three years from Udaipur. Because Rana Pratap Singh had insisted on quitting the comforts of Udaipur and fighting the Mughals in guerilla warfare conditions in the Aravali Hills, Amar Singh's first job after succession was to make Udaipur the capital of Mewar once more.

He remodeled his country's institutions, reassessing land holdings and distribution of fiefs, and established a new system of ranking for the nobility. He regulated sumptuary laws, those that control personal habits that offend a community's moral or religious conscience. Adding to the City Palace, he built the lower gateway, Badi Pol.

Although Rana Amar Singh, had given in to Mughal demands and nominally lost his independence later, his decision to sign a treaty, a commonsense decision which had the backing of the Mewar nobles, secured freedom from oppression for his people. Mewar remained the only independent Rajput kingdom of the northern empire. He went into a deep depression and lived a secluded life in a small haveli (manor) at Ahar. Succeeded by his son, Karan Singh, Amar Singh was also the first Rana to be cremated at Ahar, where his young successor erected a magnificent white marble cenotaph.

Fig 5 a: Rana Amar Singh I

Fig 5b : Rana Amar Singh I Chattri

RANA SANGRAM SINGH II (March 24, 1690 - January 11, 1734)

Rana Sangram Singh II was the sixty-first ruler of Mewar (r. 1710-1734) and son of Maharana Amar Singh II. The actual date of his coronation was February 26, 1711. He was aged 20 when he began his twenty-four-year rule, and died at the age of 44. His sons were Jagat Singh, Nath Singh, Bagh Singh and Arjun Singh.

One of his prime achievements was Sahelion-Ki-Bari. He was cremated, along with twenty-one wives who committed Sati, at the royal crematorium Mahasatya ji. His chattri is the biggest and tallest Chattri in the complex having 56-pillared cenotaph. Sangram Singh's death marked the onset of Maratha ascendancy followed by his son, Jagat Singh (II), succeeded him.

Fig 6a : Rana Sangram Singh II

Fig 6b : Rana Sangram Singh II Chattri

Section II - Site Significance

The Ahar cenotaph complex houses various religious components .
1. More than three hundred and nineteen cenotaph.
2. 10th century temple of Lord Shiva and Parvati.
3. Step wells.
4. Sacred Trees and surrounding landscape.
5. Kund

CEREMONIAL, MEMORIAL AND FUNERARY ARCHITECTURE

The unique architectural style of the chattri gives the site a factor of timelessness and a sense of visual as well as architectural evolution. The presence of temple,step well, the surrounding landscape, sacred trees and numerous cenotaph within the site makes it unique due to its association with people for different activities and rituals practiced till date. The site also stands as a unique example of living heritage due to its association to funerary activity of the royal family. However the site has faced ignorance as a significant heritage component of the historic town with lack in the number of people visiting the site.

Fig 7a : Commencement Puja carried in the month of August 2013 *Source : MMCF*

Fig 7b : Puja carried by MMCF before the initiation of work

An Urban Component :

Apart from being an important architectural heritage site the Ahar cenotaph complex is also contributes as a significant urban component to the city, associated to the late rulers of Mewar.

Decentralizatization of Urban Heritage :

In the precinct times the complex is usually situated outside the city walls of the town within a defined section of the surrounding landscape, near a water body to isolate it from the main settlement due to its association with funerary rituals. (Ref Fig: However in the present day context,and with the growing urbanization the site almost settles itself within the urban areas. Even though with a relative change in the location, the Complex becomes an important Decentralized heritage away from the core, carrying a sense of identity of the heritage town.

Historic Component Defining Skyline

The Ahar Cenotaph complex consists of more than 300 chattris of different size, architectural style belonging to different period. The Site is a significant component of the Skyline of Udaipur evolving through diffferent background layers of urbanization.(Ref: Fig 9)

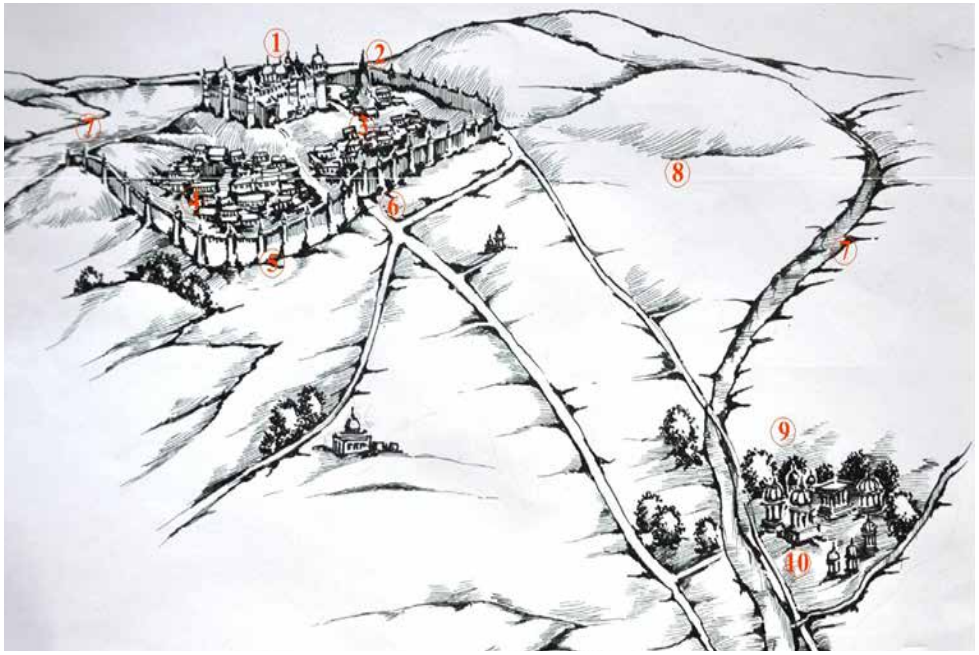


Fig 8 : Image Showing the allocation of spaces in Mewar Settlement *Source: MMCF*

1. Palace/ Fort (Capital Settlement Focal Point on Higher Terrain)
2. Temple / Temple Square(major Open Space within the fortified settlement)
3. Market Square
4. Town Settlement
5. City Fortified Wall
6. City Gate
7. Water Body (River, Stream, Tank, Kund)
8. Surrounding Landscape
9. Vegetation (Garden/ Bagh/ Orchard)
10. Cenotaph (Within Surrounding Landscape)

Fig 9 : Image Showing the skyline created by chattris

2.3 - IN TRANSITION

The Ahar cenotaph complex underwent various evolution within the complex as well as outside surrounding. The site is unique in its way of gradual evolution in the construction style of Mewar. The fact is well illustrated through the use of various construction techniques, architectural elements and material used.

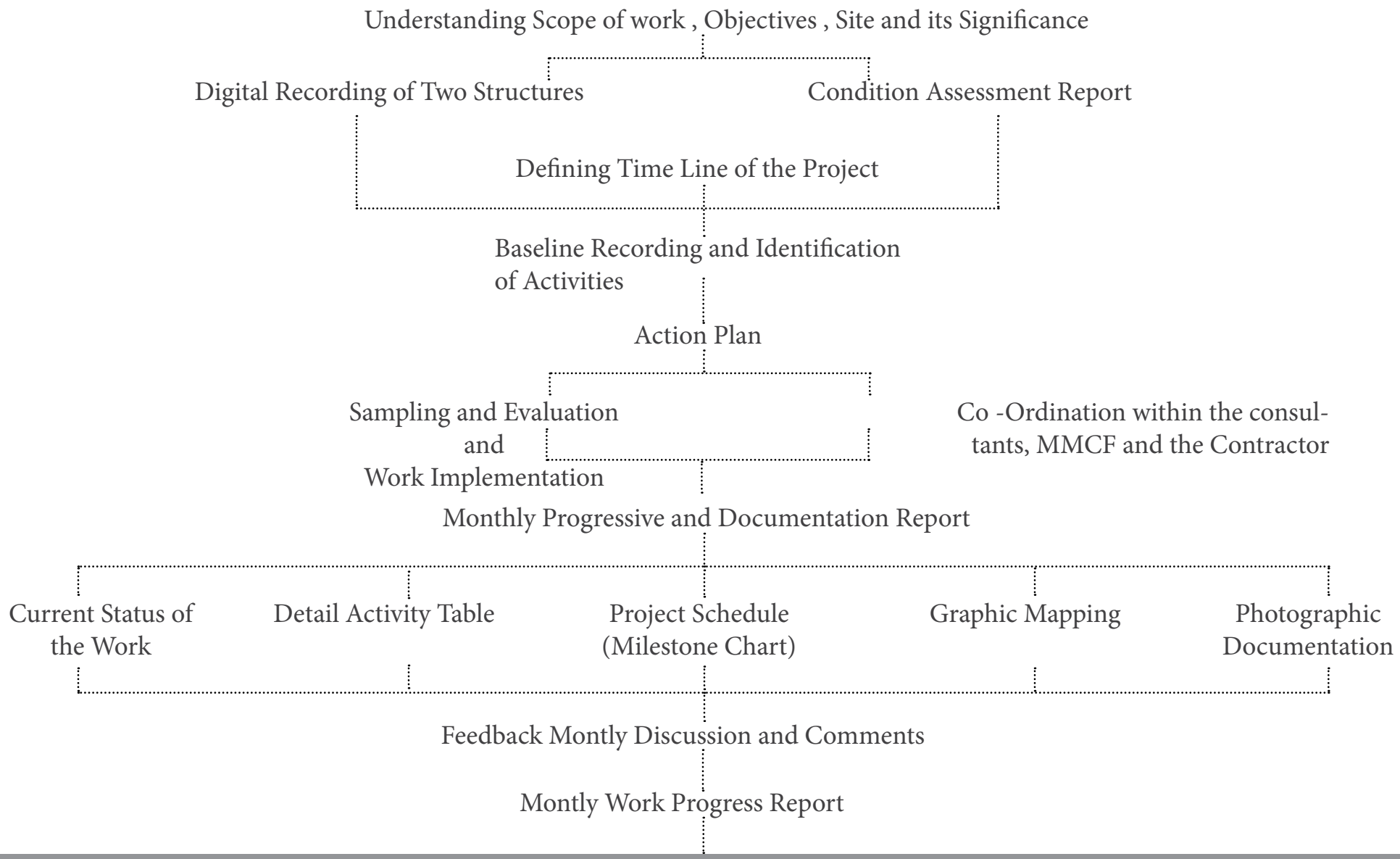
At the same time the site has faced various challenges and lack of maintenance due to natural weathering, changing stakeholders .Fig 10 and Fig 11 shows a comparision in the view Rana Amar Singh I Chattri and the nallah that is a part of landscape.

Source : British Online Archives

Fig 10: Historical view of cenotaph Maharana Amar Singh I and the nallah

Fig 11 :Present day View of Cenotaph Maharana Amar Singh I and nallah

Section III - Approach and Methodology



The report would thus form a baseline of the conservation manual adopted for future restoration works within the framework of Conservation Management Plan of the complex.

Ref Annexure I : Progressive Report (June 2015)

Section IV - Conservation Work

4.1 - BASELINE RECORDING AND IDENTIFICATION OF ACTIVITIES

Analysis of the structure, identification of defects and analysis of the cause of deterioration aided to the decision for conservation measures to be undertaken to safeguard the built structures.

Based on the physical condition following are the identified activity

1. Cleaning and Restoration of stone surface (Ref: Fig 12)

2. Removal of vegetation ingress (Ref : Fig 13)

3. Rebuilding and Replacement of structural members (Ref: Fig 14)

4. Repair of structural cracks (Ref: Fig 15)

5. Redoing of lime stucco plaster (Ref Fig : 16)

Fig 12

Fig 13

Fig 14

Fig 15

Fig 16

4.2 - ACTIVITY 1- CLEANING AND RESTORTION OF STONE SURFACE

Physical Condition

1. Blackening of the stone surface due to water accumulation on the surface. (Ref Fig: 17)

2.Water seepage at the junctions causing weathering of stone and blackening of the stone surface (Ref Fig: 18)

3. Deterioration of stone surface due to bird dropping (Ref Fig: 19)

4. Flaking of stone surface due to weathering of the stone at the corners of the chattri. (Ref Fig: 20)

5. Calcination on the stone surface caused due to layering of stone powder when it comes in contact with water. (Ref Fig: 20)

Fig 17: Flaking of stone surface

Fig 18: Water seepage from the joints in the ceiling

Fig 19: Bird dropping causing deterioration

Fig 20: Calcination and flaking of stone surface

4.2.1 CLEANING OF STONE SURFACE - RANA AMAR SINGH I CHATTRI

Rana Amar Singh I chattri is the amongst the oldest chattri in the cenotaph complex. It is also amogst the most intricately carved ones. Over the period, the chattri has gone through deterioration of the stone, turning black and loosening the finess. For the purpose of cleaning the surface two methods were adopted.

1. Cleaning through Clay Pack Technique
2. Cleaning using Water and Soap solution

Work Technique

Cleaning Using Clay Pack Technique

A mixture of magnesium tri silicate is mixed with ammonia carbonate+ hydrogen per oxide + teepol +tri ethanolamine and water is made and applied on the surface. The mixture is then covered with a plastic sheet for 24 hrs. The sheet is then removed and mixture is allowed to dry. Once dried the surface is then scrubbed with a brush and water to obtain a clean surface.

Cleaning using water and soap solution

Water and Soap solution is used to clean the surface. The surface is allowed to soak for sometime. Followed by it the surface is then scrubbed with brush and clean water.

Fig 21 : Rana Amar Singh I stone surface before cleaning

Fig 21a : Rana Amar Singh I stone surface after cleaning

Fig 22a : View of the column, capital and beam of Rana Amar Singh I chattri before cleaning

Fig 22b : View of the column, capital and beam of Rana Amar Singh I chattri after cleaning

Fig 23: Mixing of ingredients

Fig 24: Application of clay pack to the surface

Fig 25: Covering the surface with plastic for 24 hr and then remove the plastic to let it dry completely

Fig 26: Remove the clay pack by washing the surface with water and scrubbing with brush.

Ref : Annexure II

BEFORE / AFTER PICTURE RANA AMAR SINGH I CHATTRI

Fig 27 :View of Rana Amar Singh I Chattri before Cleaning

Fig 28: View of Rana Amar Singh I Chattri post Cleaning

4.2.2 CLEANING OF STONE SURFACE -RANA SANGRAM SINGH II CHATTRI

Rana Sangram Singh II chattri is the largest chattri of Ahar cenotaph complex. The chattri is majorly constructed in stone using lock and key method, and the dome is constructed in stone masonary with marble cladding. The major issue faced for the surface in Rana Sangram Singh II chattri is that of calcination caused due to layering of stone powder when it comes in contact with water. Cleaning is done using multiple techniques.

1. Cleaning using Clay Pack technique
2. Cleaning using Water and Soap solution
3. Cleaning using chissel through scrapping technique.

Work Technique

Cleaning Using Clay Pack Technique

Ref. : Annexure II

Cleaning using water and soap solution

Ref: Pt. 4.2.1 - Work Technique

Cleaning using water and soap solution

The method is used in areas affected by calcination. Chissel and hammer. The layer is scrapped of with a light hand so that it doesnt affect the stone surface.

Fig 29: Before and After image of Calcination on stone surface - Rana Sangram Singh II chattri

Fig 30: View showing before and after image of Rana Sangram Singh II chattri

Fig 31: View showing cleaning of calcination on stone surface - Rana Sangram Singh II chattri

BEFORE / AFTER PICTURE RANA SANGRAM SINGH II CHATTRI

Fig 32: View of Rana Sangram Singh II Chattri before cleaning

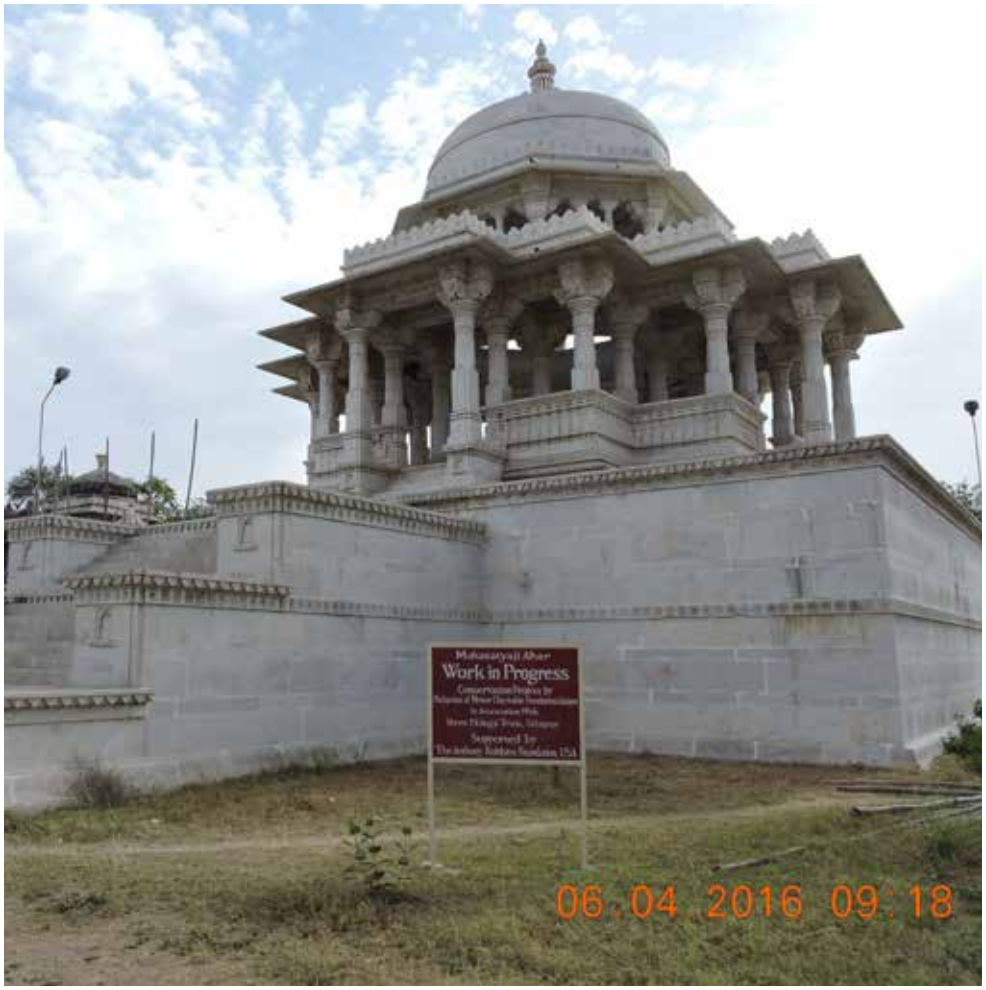


Fig 33: View of Rana Sangram Singh II Chattri post cleaning

Physical Condition

1. Cracks have developed due to extensive vegetation overgrowth with roots penetrating into the parapet wall leading to water seepage.

2. Damaged top layer of the lime cement concrete flooring at terrace level and dome leading to water ingress and vegetation overgrowth, further leading to cracks in the masonary.

Fig 34 : Vegetation Ingress in Parapet joints

Fig 35 : Vegetation Ingress in floor

Fig 36 : Vegetation Ingress on the dome surface

Various technique were tested for the ingress as the roots penetrated within the joints.

Sampling and Evaluation

Urea Mixed in Water

Clean the surrounding area of the plant. Urea is taken and spread on the ground around the stem and roots. Water is added till it becomes a paste and penetrate inside the roots. To keep the action functioning water is added in every 2-3 hours to keep it wet.

Kashmish Mixed In Water

Kashmish- As demonstrated by the contractor kashmish is a white fine granular powder of stone mixed in powdered roots of Khejadi , Sangdi, and Kathod Plant.

The powder is then mixed with water for two three hours that it gets dissolved well. The mixture so obtained is then fed to the roots of the plant. The process is then repeated for five to six times in a week and the results are documented.

Work Technique

Asafoetida (locally known as hing) Water and Slaked Lime

10gm asafoetida is dissolved in 200 gms of water (200ml). Make it liquefied either by keeping it soaked for a night or for the quick process use hot water. Water turns yellowish in color. Slaked lime (sojat ki kali) is mixed in 200ml of water. The mix is stirred well to let the lime settle at bottom. The upper white liquid that floats on top is mixed it with the hing water. With the help of injection (used for animals), the mix of the two is injected in the roots. The process is repeated 5-6 times on alternate days.

Manual Plucking of Plants

Areas on the terrace when the growth of vegetation took place holes of water drainage were plucked manually.

Fig 37 : SamplingUsing urea paste in water

Fig 38 : Sampling using Kashmish Powder

Fig 39 : Sampling Using Hing Water and Lime

Physical Condition

1. Weathering of mortar due to water seepage leading to further opening of masonary joints.

2. Broken and loose sunshades due to monkey menace.

3. Falling parts of corbelling stones from the dome due to the natural weathering.

4. Loss of details like cornice bands at the parapet level due to collapsed stone parapet wall from one side of the chattri.

5. There is a structural crack in the dome rising upto 4 feet in Rana Amar Singh I chattri due to uneven load transfer from the dome.

6. Crack in the pillar due to undue settlement in the eartth leading to movement of the existing members

Fig 40 : View of broken parapet at level II

Fig 41 : Broken parapet Wall at Level II

Fig 42 : Structural crack in the corbelling of the dome

Fig 43 : Missing Chajja due to monkey menace - Rana Amar Singh I chattri

Work Technique

Pre Cast members, in matching shape and size and compatible material to be replaced on site in missing areas.

The intervention of the new Structural members introduced against the undue movement of the existing members, follows a similar language of carving and use of stone as existing on Site. The technique used for restoration is most sensitive in its ways thus respecting the historic culture and architectural heritage of Mewar.

Fig 44: Fixing of Chajja in progress - Rana Amar Singh I chattri

Fig 45: View showing replaced chajja at Rana Amar Singh I chattri

Fig 46: View of the parapet section reinstalled

Fig 47: View of the Shivling after replacing the top

Work Technique

The chattri of Rana Sangram Singh II chattri is relatively less damaged than Rana Amar Singh I chattri.The structural work includes

Supporing the bay of pillars of Octagan with two pillars in each bay.
Restoration of the ear of nandi where the shrine is located.

Similar methodology is used for restoration like Rana Amar Singh I chattri where in pre Cast members, in matching shape and size and compatible material is replaced on site in the missing areas.

Fig 48: View of level II of Rana Sangram Singh II chattri before restoration

Fig 49: Replacement of ear of Nandi (the bull)

Fig 48a: View of level II of Rana Sangram Singh II chattri after restoration

Physical Condition

1.There is opening of masonry joints which leads to water seepage and efflorescence.

2. Growth of micro organisms along the joints of the stone surface due to water seepage.

3.Patches of cement plaster can be found on the outer surface of the walls.

Fig 49: Crack in the column caused by undue movement of stone members

Fig 50 : Growth of micro organism in carving

Fig 51 : Visible patches of past repair in cement

Work Technique

Lime mixed with Jinki

Tradional mewar technique of fixing joints using Lime and Jinki (marble Powder).
Lime is soaked in water or about 15-20 days in a tank. Lime paste is then taken out of the tank and grinding is done either in hand grinder or mechanical grinder.

Jinki (fine marble dust powder) is then mixed in fine paste of lime. If required as per the building shade, color is then added. The paste is good to be filled in cracks and when consolidated and dries up strengthens itself over time

Fig 52 : View of patches of corbelling finished with lime and Jinki paste

Fig 53: Close view of lime and Jinki filling to match the design

Fig 54: Filling of crack at plinth base

4.6 - ACTIVITY V- REDOING OF LIME STUCCO PLASTER

Physical Condition

1. Cracks have developed in the lime plaster allowing water to percolate into the masonry. This also leads to extensive vegetation overgrowth on the outer surface of the dome.

2. The top layer of the lime flooring at the terrace level is also found damaged leading to exposure of inner brick and stone masonary.

Fig 54: Deteriorating layer of lime plaster over the dome.

Fig 55 : Damaged flooring layer Rana Amar Singh I Chattri

4.6.1 REDOING OF LIME STUCCO PLASTER - RANA AMAR SINGH I CHATTRI

Lime plaster done for Rana Amar Singh I chattri in traditional mewar style.

Fig: 56: View of the dome of rana Amar Singh I chattri

Fig: 56a: View of the layer 1 of restoration work using Lime, Surkhi and sand

Fig: 56b: Closer view of the material texture during the restoration process

Fig: 56e: View of the dome after completion of dobara and nikhalas

Fig: 56d: View of the finishing being given to lime and jinki quote

Fig: 56c: Surface of dome left for drying before applying lime and Jinki

Work Technique

LAYER I - Lime Sand Surkhi Mortar for Plaster

(i) Unslaked lime + Burnt brick(Surkhi) + Sand are mixed in a proportion of either 1: 1: 2 or 1: 1: 1 respectively

a. Slaking of lime

As the lime is unslaked so it has to be converted into slaked lime.

Lime is taken into drum and water is poured into it. The mix needs to be stirred continuously.

When the effervescence finishes, the lime becomes slaked. This process takes 1 to 2 days

b. Lime plaster.

Surkhi(Brick Powder) in powder form, crushed with the help of hammer or machine. Lime, surkhi and sand are mixed either by gharat for lime mixing machine. Water is added simultaneously.A mound is made and kept or about 15 days, and with the help of spade the mixture is cut and water is added continuously. Keep it for 15days. It is ready to use for 1st layer of plaster.

LAYER II - Lime and Jinki

Lime paste and marble powder are mixed in a proportion of 1:1

When the lime plaster layer gets half dried (i.e. kept for 2-3days), the mixture is applied on lime plaster.

LAYER III - Dobara

It is a mixture of dry Lime and Jinki (pulverized to a more extent than Layer II)mixed in water in the ratio o 1:3 and grounded by hand or mechanical chakki to the required plasticity. Dobara gives a fine finish wherever Lime Jinki coat is finished.

LAYER IV - Nikhalas

Prepared by grinding Lime paste and straining through muslin cloth in a way that strained lime comes out of the cloth drop by drop. It is used to give final finish after dobara. Thickness of 1-2 mm.

LAYER V - Nikhalas

Foam of Lux powder is spread to give final shiny surface.

Fig: 57: View of the lime terracing redone

Fig: 58: Image showing Kalash after restoration and finshed using gheru

Section V - Spreading Knowledge Hands on Learning

5.1 HANDS ON SITE SESSION WITH STUDENTS

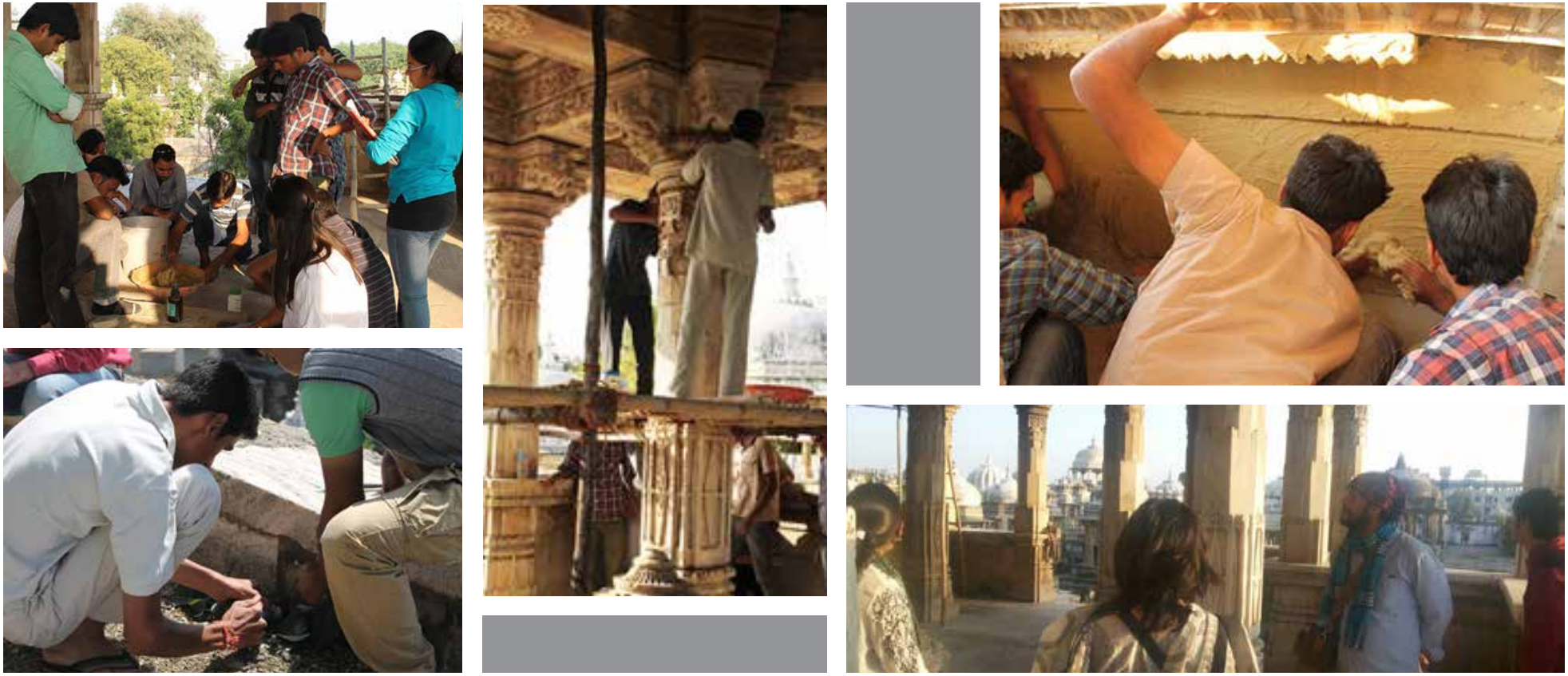


Fig: 59: Photo Collage of various activities conducted on site while learning the process of restoration

Along with the conservation work carried by the two chattris students of architecture and other historians were also invited monthly to observe, participate and learn the art of conservation. The objective behind inviting these students, historians and research scholars is to educate the future generations about conservation so that one can preserve precious works of architecture in the long run.

The idea of the hands on learning is focused on skills development in restoration process for students of architecture and crafts-persons in the region through field training programme on site by undertaking complete restoration works of the two Cenotaphs including imparting knowledge of: (Ref: Fig 59)
a) Traditional techniques and materials
b) Historic Architectural Styles of Mewar

Workshop 1- Understanding Lime as a material in Conservation

As a part of awareness program a workshop was organized under the aegis of Maharana of Mewar Charitable Foundation on Lime. The workshop included on field session that explained mixing of Lime and its application where students could get an experience of hands on site with Local Artisans. The workshop was focused on field training program on Lime and extended into a learning about various techniques involved in the process of restoration of historical buildings.

Fig 60: Image showing mixing of lime in mechnical Gharat

Workshop 2- Restoring the Significance , Ahar Cenotaph Complex

Within the integral framework of project and spreading awareness about conservation of the site, a workshop was conducted for students. The workshop was designed as one of the first step to re-focus on the site as a significant historic compnent of the city. The idea of the workshop was to work towards a larger goal in restoring the significance of the site and surrounding as an important de- centralized heritage component of the city.

Following schools were involved for workshop and hands on site learning:
Buddha Group of Institutions
School of Planning and architecture, Delhi
Bharti Vidhya Peeth, Mumbai

Fig 61: A picture taken at the end of workhop at Rana Sangram Singh II chattri

Fig 62: Workshop II- Picture showing discussion with MMCF after display of work done during workshop

Section VI - Way Forward

6.1 WAY FORWARD

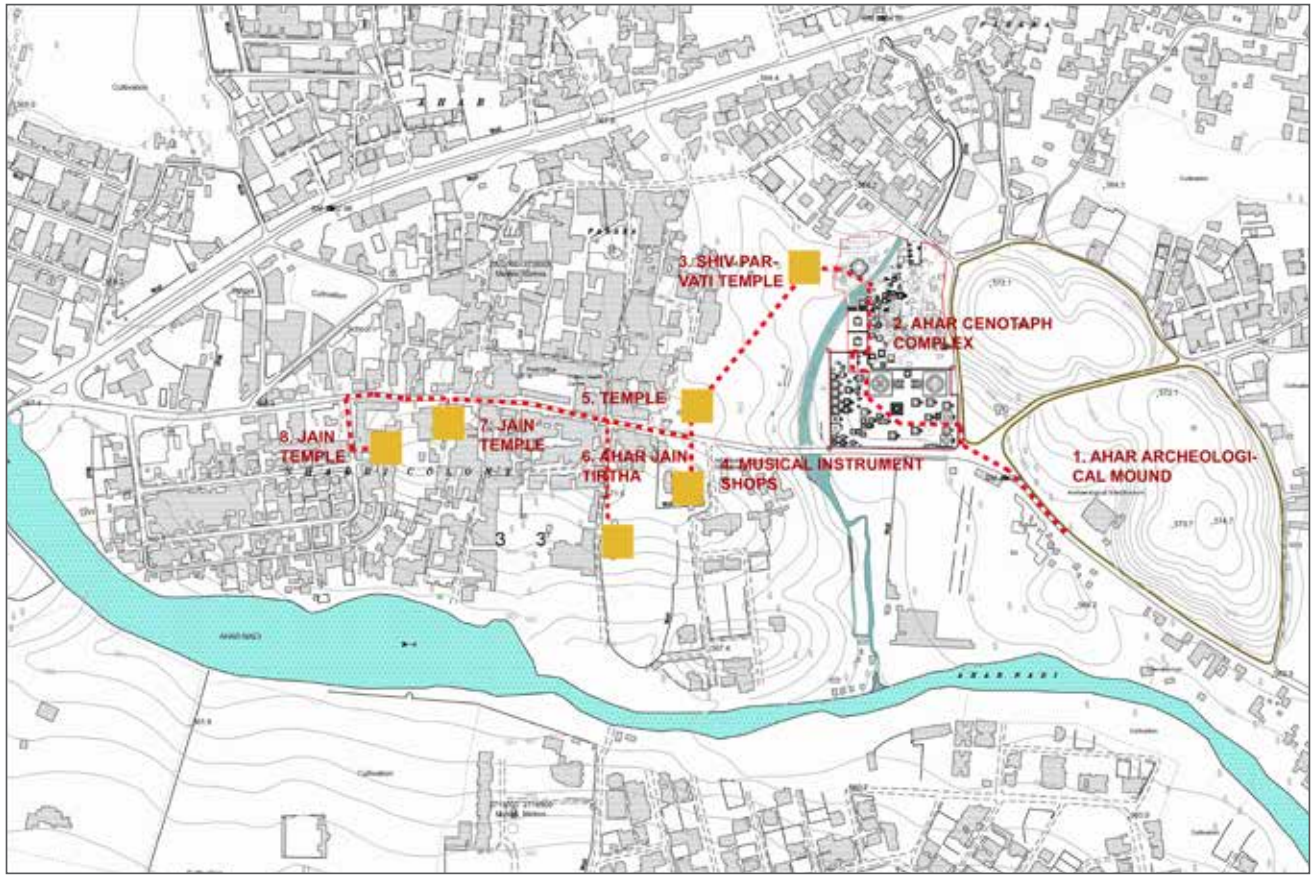
The Ahar cenotaph complex is a unique site, associated with the funerary activity of the royal family and intergrates cultural, architectural and more importantly continuity values. The site also attains high significance as a remarkable urban component of Udaipur and shares it surrounding with The Ahar settlement carrying different layers of history over a period of more then 4000 years old. The site is of high significance.

It is important to make the heritage of the site more meaningful for the local community as well as the tourist, that develops a sense of belongingness. The initiation of the restoration work for the two cenotaph forms a baseline for further restoration (tangible and intangible) of the site brought through research, Sustainable development and monitoring of the site.

Further a strong documentation of the site that explores concept of cenotaph, the site and its evolution followed by the heritage management plan is recommended to showcase the value of this unique cultural heritage site.

6.2 PROPOSAL - A HERITAGE WALK, AHAR COMPLEX

A heritage walk is proposed for the cenotaph complex and the surrounding vicinity as an initiative to restore the lost significance of the area. This was an initiative to sensitize and actively involve the local community, and the tourist to the architectural and archaeological heritage of mewar.

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PROJECT TEAM

Academic Documentation and Restoration - Niriti Porwal and Team, Nirnik

Condition Assessment Report - Dr. Shikha Jain, Dronah

Art Conservator - Mr. S. Girikumar, Pune

Contractor (Restoration work) - Mr. Mahendra Sompura and Team, Pali

Contractor (Restoration work) - Mr. Suhalka and Team, Udaipur

ACKNOWLEDGEMENTS

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We would specially like to thank Mr. Ajay Vikram Singh, Mr. Bhupendra Singh Auwa, Col D.B. Acharya, Dy. Mayank Gupta and The Anthony Robbins Foundation, USA for support and coordination.

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PROGRESSIVE REPORT
FOR RANA AMAR SINGH I AND RANA SANGRAM SINGH II CHATTRI AT MAHASATYA JI

PROJECT LOCATION:

Mahasatya Ji Complex
Ahar, Udaipur

Date: 13th July, 2015

SUBMITTED TO:
Col. D B Acharya
Maharana of Mewar Charitable Foundation,
The Eternal Mewar, City Palace Complex
Udaipur

SUBMITTED BY:
Niriti Porwal
NIRNIK
Fatehpura, Udaipur

June 2015

Index

Section 1.

1.1. PROJECT DETAIL

	Details
Type of Project	Conservation
Work conducted on site Includes	Restoration of two Chatri (Rana Amar Singh I, Rana Sangram Singh II)(Refer Image - 1.1.1-1.1.2)
Working Agency on site	Sompuras and Suhalkas
Estimated Time Duration	10-12 months for both the Chattri
Actual Time Frame	19months

Image1.1.1- Chattri 1- Rana Sangram Singh II (r.1710 - 1734 AD)

Image 1.1.2- Chattri 2 - Rana Amar Singh I(r.1597 – 1620) AD)

Section 2. MONTHLY PROGRESSIVE REPORT

Submitted for the month of **June 2015**

Work Progress – June 2015

The following chapter takes care of the work progress during the month of June. This month majorly takes care of Cleaning of Stone Surface, filling of structural cracks on the inner side of the dome, rebuilding of structural members and repair work and lime plaster at Rana Amar Singh I Chattri

2.1. CURRENT STATUS OF THE PROJECT

Rana Amar Singh I Chattri

Rana Amar Singh I Chattri	Identified Activities				
Structural members	Removal of Vegetation Ingress	Filling of Cracks	Restoration of Stone Surface	Redoing the Lime/Stucco Plaster	Rebuilding and Replacement of Structural Member
Plinth Base					
Steps					
Floor					
Column					
Chajja					
Beam					
Parapet wall					
Ceiling					
Level II Terrace					
Dome/ Dome ceiling					
Average Number of people Working on Site : Sompuras: Four - Five					
COMMENT – Work in progress on Rana Amar Singh I Chattri					

2.2. DETAIL – MAJOR ACTIVITY

Detail Activity – Work Progress

Activity - 1

Particulars	Comments
Activity	Cleaning and Restoration of Stone Surface.
Work Location	Rana Amar Singh I
Material / Technology Used	Water and Soap solution
Method of Application	Cleaning using Water and Soap solution and scrubbing it with brush
Time Frame	Maximum work completion at Rana Sangram Singh II Chattri and Cleaning Process in progress at Rana Amar Singh I chattri at Level II.
Comments	Some surfaces require a touch up

Activity - 2

Particulars	Comments
Activity	Repair of structural cracks
Work Location	Rana Amar Singh I
Material / Technology Used	Filling of crack using Lime and jinki paste
Method of Application	Ref Annexure 2.8.3
Material / Technology Used II	Filling of structural crack / Filling of portions of broken members
Method of Application	Filling using jinki powder, Lime and adhesive (aralite)
Time Frame	Around 20-25 days for making of paste. Application of paste is instantaneous on site by mixing around 250 gms every time in water and filling the crack.
Comments	The composition of the plaster needs to be maintained to avoid cracks.

Activity - 3

Particulars	Comments
Activity	Rebuilding and replacement of structural members
Work Location	Rana Amar Singh I Chattri
Material / Technology Used	In- Situ carving of Kangura and parapet wall Re- fixing of Chajjas
Method of Application I	1. Kangura and parapet wall made in marble from makrana on site to match the size the existing size and carving design. 2. The chajjas are cut to the size of chajja to be replaced. The old chajja is removed approximately 1 ft to anchor and counter weight the new one inside. Once it is well inside and the notch is fixed the chajja is fixed using cement mortar so that it can dry quickly.
Time Frame	2-3 days per chajja
Comments	Work in Progress of Kanguras and fixing of chajja

2.3. PROJECT SCHEDULE

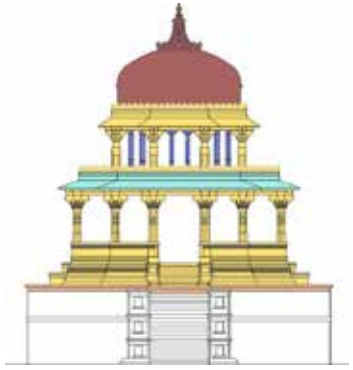
Milestone Chart – Planned V/S Actual

	Work to be completed as based on master schedule	Work completed as on site visits	Comments
Rana Amar Singh I Chattri			
Activities On site	1. Cleaning of Stone Surface for Rana Amar Singh I Chattri. 2. Repair of Cracks Rana Amar Singh I Chattri. 3. Repair of Structural Members	1. Cleaning of Stone Surface in the base and level I finished. 2. Repair of cracks in progress 3. work to be completed	1. Cleaning still remaining on the top side of chajja. Cleaning of plinth base in progress. Cleaning of Kalash to be done with care to prevent the lime plaster from being affected. 2. The pointing done at the joint need to be more neatly done. At few locations the cement pointing needs to be removed and replaced by lime mortar. 3. Fixing of Chajja in progress.
Rana Sangram Singh II Chattri			
	1. All work culmination	1. Maximum work finished	Lime terracing to be done by other contractors who will be sent by MMCF. Few locations cleaning of stone surface to be completed.

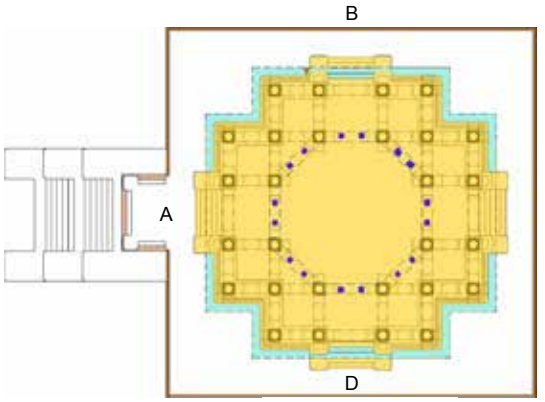
2.4. GRAPHIC MAPPING

Work Progress – Rana Amar Singh I

Elevation B



Elevation A



Plan

Color Code	Work Stage
Cleaning of stone surface	
	Work In Progress
	Work Completed
Rebuilding of structural member	
	Work In Progress
	Work Completed
Filling of structural crack	
	Work In Progress
	Work Completed
Lime Plaster	
	Work In Progress
	Work Completed

2.5. PHOTOGRAPHs

Rana Amar Singh I Chattri

2.5.1 – Close view of the lime plaster and the Kalash on dome

2.5.2– View of Fixing of Chajja for Level I – Work in Progress

2.5.3 – View of Cleaning process in progress for plinth base

2.5.4 – View of the cleaned surface for the base

2.6. KNOWLEDGE SHARE

2.7. DISCUSSIONS AND COMMENT

- The Kalash of Rana Amar Singh I to be cleaned with care so that it doesn't spoil the lime plaster of dome.
- Rana Amar Singh I chattri and Rana Sangram Singh chattri to be covered with a pigeon net at dome level and Level II to avoid Bird dropping all over the floor from ceiling and also it would save the corbelling.
- The site was closed from 25th of May 2015 to 5th of June 2015 and hence the work was relatively slow.
- In order to finish the work on time increase in man power required.
- Lime Terracing on Rana Sangram Singh II chattri to be finished before monsoons.
- The work is expected to extend for another month or two.

2.8. ANNEXURE

2.8.1. Clay Pack Technique

A mixture of Magnesium Tri Silicate mixed with Ammonia carbonate+ Hydrogen per Oxide + Teepol +Tri Ethanolamine and Water is made as per the instructions and applied on the surface. The mixture is then covered with a plastic sheet for 24 hrs. The sheet is then removed and mixture is allowed to dry. Once dried the surface is scrubbed with a brush and water to obtain a clean surface.

2.8.2. Rebuilding and Replacement of structural members

Stone Pillars to match specification of 9" x 9" are pre – cut. The members are then manually fixed to each other through tongue and grove joint and installed on site using lime mortar.

2.8.3. Refilling of structural cracks

Tradional mewar technique of fixing joints using Lime and Jinki (marble Powder). Lime is soaked in water or about 15-20 days in a tank. Lime paste is then taken out of the tank and grinding is done either in hand grinder or mechanical grinder. Jinki (fine marble dust powder) is then mixed in fine paste of lime. If required as per the building shade, color is then added. The paste is good to be filled in cracks and when consolidated and dries up strengthens itself over time.

2.7.4 Lime plaster

1. Lime Sand for Plaster

A masonry tank is constructed and filled with clean water. Quick lime is poured in the water. Heat is generated during the process that dissipates in the form of bubbles. The mix is stirred with a bamboo pole. The lime paste thus formed is kept in the tank for couple of days till the heat dissipates. The lime paste and sand is spread in gharat in the required proportion i.e. (1:2 or 1:3) of lime and sand and grinding is done in gharat for about 3 hrs. A labor follows the gharat to cut and mix the mortar continuously.
Following items are mixed in on gharat full mortar and the time of grinding to increase grip and plasticity of mortar. All items are added in paste form except hemp.
(a) Guggal – 500 gms, (b) Jaggary – 3kg, (c) Hemp- 250 gms (d) Methi or Urad flour – 2kg
2. Lime Surkhi mortar for plaster
Surkhi is prepared by breaking burnt bricks in smallest possible pieces. Sand and surkhi is mixed in lime and grinding is done in proportion 1:1:1 or 1:1:2 of Sand: Surkhi: Sand.

3. Lime and Jinki
Lime paste is taken out of the tank and grinding is done in hand chakki or mechanical chakki. Jinki (fine marble powder) is then mixed in fine paste of lime.

4. Khamira
This is special preparation of lime used as wash only. Lime and water mixture is kept in drums and kept for 2-3 months. Every alternate day old water is taken out and new water is added in the drum. The paste is then used as lime washes and gives very white finish. The old water has some lime content, is sprayed on old stone pillars and carvings for protection against weathering effect.

5. Dobara

It is a mixture of dry lime and jinki mixed with water in the ratio 1:3 and ground in hand or mechanical chakki to the required plasticity. The dobara is used to give fine finish where lime jinki coating is done.

6. Nikhalas
It is a special type of lime wash prepared by grinding the lime paste first then straining it through fine muslin cloth in such a way that strained lime comes out of the cloth drop by drop. This is used to give final finish wherever dobara is applied over lime jinki coating.

2.7.5 Base time break-up

The Schedule as discussed with the contractor on site is on a broader line to monitor the progress of work. Following is the work schedule for the restoration of work to be carried out for Rana Amar Singh I Chattri and Rana Sangram Singh II for the remaining time.

Months	RANA SANGRAM SINGH II CHATTRI	RANA AMAR SINGH I
November		
December		
January		
February		
March		
April		
May		
June		

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