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Case Study: Conservation of Bhudargad Fort

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Abstract: *Maharashtra is gifted with many historical monuments which represents it's tradition and culture. These monuments are of national important for safeguarding the history of Maharashtra and will also help in development and promotion of tourism. Many such monuments are in the form of forts which are now deteriorated due to lack of conservation. It is of due importance to conserve these forts in order to save them from ruining completely. A case study was conducted on Bhudargad fort which is situated in Kolhapur district of Maharashtra to study it's current scenario and the conservation work that is being carried out on the fort. A checklist was prepared to make the conservation work more organized which will be required before the conservation work and for future maintenance.*

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I. Introduction

India is gifted with varied historical monuments. All monuments represents different traditions, cultures, religions, home of various forms of art & handicrafts, music and literature, architectural styles[1]. These monuments are required to be preserved for it has historic importance. If the monuments are conserved they can be of good use for tourist attractions. The forts in Maharashtra are at a deteriorating state and needs urgent attention of the Authorities for conservation. If these forts are not conserved at this very point, it will be of great difficult for conserving them later on as they are deteriorating at a very fast pace. The present study focuses on the conservation work done at Bhudargad Fort and presents a checklist which will be helpful for conservation of other such forts in Mahrashtra.

II. Methodology

The main objective of this study is to prepare a checklist that will be required for the conservation of forts and for their maintenance post conservation. For this purpose, a case study was conducted on Bhudargad Fort to study the conservation work that is being going on the fort. By studying the conservation work of the fort a checklist was prepared which will be required during conservation of such forts in future to observe the condition of fort before conservation.

III. Case Study

The case study was conducted on Bhudargad Fort which was built by Raja Bhoj II (Shilahara dynasty). It is situated in Kolhapur district and 90 km away from Kolhapur city towards south side. As it is located on the kokan border it has faced heavy rainfall causing damage to the heritage wall which is fence to the fort. During summer the temperatures rises as high as 39°C which amplifies the deteriorating of the fort. The open space around the fort is covered with vegetation.
The most different and important feature of this fort is the vision range in all four direction. [2]
Fig. 1 presents plan of Bhudargad Fort.

The list of monuments in Bhudargad fort are as follow:
1. Bhavani Temple and Dhudhsagar lake
2. Entrance of east, its continuous bulwark.
3. Shiva's Temple
4. Deepmal – The designed rock where keeping lamps at night.
5. Eastern Buruj
6. Bhairvnath Temple
7. Jakhin Caves.

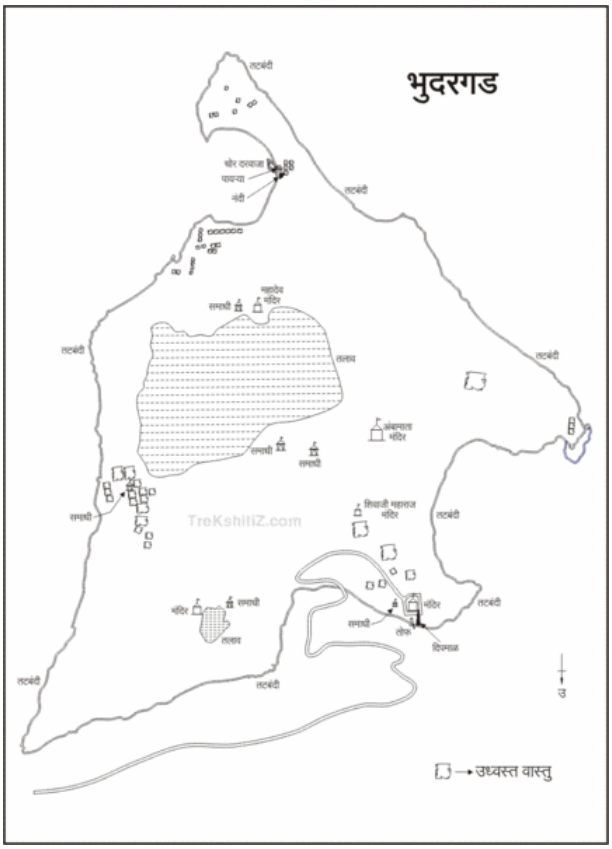

Fig. No.:1 Plan of Bhudargad Fort

The Department of Archaeology of Maharashtra has decided to conserve this fort. After visits conducted to the fort it was observed that many part of protection wall were damaged. The entire top part of protection wall had been totally collapsed. The growth of forest vegetation around the protection wall was undesirable. Differential settlement of the protection wall was observed. The slab of Bhairvanath temple showed signs of leakage. The valuable ancient remains (Vastu Avashesh) were covered by silt.

Based on these observations the Government of Maharashtra opened a tender for conservation of this fort and estimated its cost to Rs. 499 Lakh.

The scope of work included the following:

1. Removing of forest vegetation from inner and outer side of protection wall.
2. Pointing to protection wall.
3. Scientific excavation.
4. Conservation of monuments which is shown after scientific excavation.
5. Conservation of protection wall.
6. Providing and fixing of sign boards.
7. Proving and fixing of cultural notice boards.
8. Conservation of available parts of monuments.
9. Providing and fixing ornamental design which will match to current available vastu.
10. Providing and fixing Guard rails.
11. Providing bore well for purpose of drinking water for visitors.
12. Provision of electricity as solar energy system.
13. Previous construction of protection wall had constructed in Laterite stone and lime. Repairing work is doing in Laterite stone and lime mortar 1:1.5, adding bonding ingredient like belfruit (30kg), black sugar (20kg) against the quantity of 1 cum lime mortar.

Fig.No.2 and Fig.No. 3 shows the conservation work carried out at the fort.

Fig.No 2: Excavation of buried structure at Bhudargad fort

Fig. No.3: Construction of protection wall at Bhudargad fort

Table.No1: Inspection Checklist before Maintenance

Inspection Checklist before Maintenance **Fort: Bhudargad** **Date :**				
Sr. No.	**Description**	**Dismantled Pointing**	**Grass covered**	**Remark**
I	**Protection wall**			
1	Substructure - East inner side			
2	Superstructure - East inner side			
3	Substructure - East outer side			
4	Superstructure - East Outer side			
5	Substructure - West inner side			
6	Superstructure - West inner side			
7	Substructure - West outer side			
8	Superstructure - West Outer side			
9	Substructure - South inner side			
10	Superstructure - South inner side			
11	Substructure - South outer side			
12	Superstructure - South Outer side			
13	Substructure - North inner side			
14	Superstructure - North inner side			

15	Substructure - North outer side			
16	Superstructure - North Outer side			
II	**Other Vastu/ Monuments**	**Yes**	**No**	
1	Is the scientific excavated area covered by silt?			
2	Is the scientific excavated area covered by grass?			
3	Is the wall of temple covered by grass?			
4	Is the slab of temple covered by grass?			
5	Is any leakage in slab of temple?			
6	Is any ornamental work damaged?			
7	Is paint to ornamental work?			
III	**Other Structures in Open Area**			
1	Is the Pathway covered by grass?			
2	Is the pathway alignment disturbed?			
3	Is the stability of sign board in good condition?			
4	Is the painting on sign board in good condition?			
5	Is the stability of cultural board in good condition?			
6	Is the painting on cultural board in good condition?			
7	Is the stability of guard rail in good condition?			
8	Is the painting on guard rail in good condition?			
9	Is the water tank in good condition?			
10	Is Water cleaning done in every six month?			
11	Is the electricity solar panal in good condition			
12	Is the garden in good condition?			
Remark :				

Table.2 Inspection Checklist after Maintenance

Inspection Checklist after Maintenance				
Fort: Bhudargad		**Date:**		
Sr. No.	**Description**	**Pointing Work Completed**	**Grass removed**	**Remark**
I	**Protection wall**			
1	Substructure - East inner side			
2	Superstructure - East inner side			
3	Substructure - East outer side			
4	Superstructure - East Outer side			
5	Substructure - West inner side			
6	Superstructure - West inner side			
7	Substructure - West outer side			
8	Superstructure - West Outer side			
9	Substructure - South inner side			
10	Superstructure - South inner side			
11	Substructure - South outer side			
12	Superstructure - South Outer side			
13	Substructure - North inner side			
14	Superstructure - North inner side			
15	Substructure - North outer side			
16	Superstructure - North Outer side			
II	**Other Vastu/ Monuments**	**Yes**	**No**	
1	Is the scientific excavated area reopened?			
2	Is the scientific excavated area cleared from grass?			
3	Is the wall of temple cleared from grass?			
4	Is the slab of temple cleared from grass?			
5	Is repaired the leakage from the slab of temple?			
6	Is repaired ornamental work?			
7	Is coloured ornamental work?			
III	**Other structures in Open Area**			
1	Is the Pathway cleared from grass?			
2	Is the pathway alignment maintained?			
3	Is the re-established the sign board?			
4	Is the repaint the sign board?			
5	Is the re-established the cultural board?			
6	Is the repaint the cultural board?			
7	Is the re-established the guard rail?			
8	Is the repaint on guard rail?			
9	Is the water tank repaired?			
10	Is the Water tank cleaning completed?			
11	Is electricity solar panel repaired?			
12	Is the garden maintained?			

IV. Conclusions

From the case study, it was observed that, the damage of the fort were observed based the past experience of the Department of Archaeology. There was a need for a solid method for identifying the damages to the fort for obtaining similar results for various forts. The checklist prepared will be helpful during conservation of forts and in future to observe the condition of fort before starting the conservation work. Also the checklist can be useful for drafting the tender documents, finalization of specification of the work and for the scope of the work and to estimate the cost required for completion of the work.

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References

[1]. Glen Prevost, Brain W. Baetz M.ASCE, Saiedeh Razavi M.ASCE, Wael EI-Dakhakhni M.ASCE (2014) - "Retrofitting Suburban Homes for Resiliency : Design Principles", Journal of Urban Planning and Development , pp 1-10
[2]. Vasant A. Matsagar, R. S. Jangid (2008) - "Base Isolation for Seismic Retrofitting of Structures", Practice Periodical on Structural Design and Construction , Vol. 13, No. 4, November 1, 2008, pp 175-185
[3]. Tong Guo M.ASCE , Weijie Xu , Lianglong Song , Longwu Wei (2014) - "Seismic- Isolation Retrofits of School Buildings : Practice in China after Recent Devastating Earthquakes", Journal of Performance of Constructed facilities , Vol. 28, No. 1, February 1, 2014, pp 96-107
[4]. Edoardo Cosenza , Lunio Lervolino , (2007) - "Case Study : Seismic Retrofitting of a Medieval Bell Tower with FRP", Journal of Composites for Construction , Vol. 11, No. 3, June 1, 2007, pp 319-327
[5]. Neha Jain (2012) - " Conservation Practices in India – A Case Study of Jaisalmer Fort", A thesis presented to the Faculty of the USC School of Architecture University of Southern California , December, 2012
[6]. On Site Review Report by Laurence Loh , (2013) - " Rehabilitation of Nagaur Fort", 2013
[7]. Office of the Assistant Director , Department of Archaeology, Govt. of Maharashtra, Pune.

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