
Excavation for Establishing an Archaeological Experiential Museum at Vadnagar: Challenges Encountered and Strategic Solutions

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Abstract: *The excavation at Vadnagar over the field season of 2016-19 has yielded significant results, which have been compiled into two comprehensive volumes of excavation reports. These findings led to the concept of creating an Experiential Museum at the excavation site, where visitors may immerse themselves in the experience of exploring the ancient remains of continuous human occupation spanning over 2500 years, all in one location. To achieve the desired outcomes of the project, targets and responsibilities were defined. Considering the potential challenges encountered during the previous excavation phase, the excavation approach has been thoroughly examined before the excavation (for Experiential Museum) being carried out. Usually, the excavated trenches are filled up after completing the archaeological excavation. However, it was crucial to preserve the excavated remnants of this multicultural site, which also had a substantial accumulation of habitational deposits that varied between 25 to 20 meters in thickness. Therefore, to safeguard these archaeological excavated remnants for future generations, it is crucial to ensure their maintenance and upkeep. To achieve this, it is essential to understand the challenges encountered throughout the process of excavating archaeological site and simultaneously conserving the unearthed structural remains and the vertical sections. This article has been focused on documenting all the various techniques employed during this excavation process, including their simultaneous conservation efforts, and the remedial measures that were devised. With this recorded data, the future strategy of conservation and preservation of the site can potentially be defined.*

Keywords: Excavation, Experiential Museum, Conservation, Fortification Wall, Archaeological Documentation, Recycling, Habitational Deposits

Introduction

The excavation at Vadnagar for three consecutive field seasons from 2016-2019 have been brought out in the final report which comprised of two volumes. Based on the outstanding results of the excavation, a concept of Experiential Museum at Vadnagar was formulated by the then Secretary, Shri Arun Goyal (Ministry of Culture) and the then Director General, Archaeological Survey of India (ASI) Smt. Usha Sharma. This museum was conceptualized to showcase the seven cultural periods of Vadnagar,

wherein visitors would be provided with an experience of archaeological remains through touch-and-feel medium. It was also proposed that an elevator would be designed for allowing visitors into the deep excavated trenches of around 20m. Consequently, a time schedule had been prepared in which the responsibility assigned to ASI was the excavation of 4000m² area, while the infrastructure development would be undertaken by the Govt. of Gujarat. For this exceptional project, 4 acres of land had been decided on for acquisition (out of which only 1 acre had been short-listed to be excavated and the rest to be utilized for infrastructure and allied activities), which is located on south-eastern bank of Sharmistha Lake (north-eastern corner of the town) (Figure 1).



Figure 1: Demarcated area for setting up Archaeological Experiential Museum, North-eastern periphery of the town

As the time schedule framed for completion of the excavation work was within 600 days by the ASI, accordingly 24 grids of 10x10m were planned for the field season 2019 onwards. Following the completion of land acquisition process in November 2020 by the Govt. of Gujarat and subsequent handing over to ASI, a large-scale excavation covering an area of approximately 3200 m² was undertaken (Figure 2). Apart from the large-scale horizontal excavation, exposition of a long stretch of 170m fortification wall has also been initiated by the ASI (Figure 3). The effort required to achieve set goals entirely depended upon the number of working days, nature of structures/findings being exposed, weather and protection shed over the excavated area to prevent damage from the rain.



Figure 2: Preparation for laying out excavation trenches



Figure 3: Excavated trenches

Challenges Faced

- Outbreak of the second Covid -19 wave led to stalling of excavation work for some time.
- The cuttings in the habitation deposit which is man-made and not so compact are exposed to the nature and can collapse.



Figure 4: Temporary shed for the protection of excavated remains during monsoon



Figure 5: After the exposition of segment 2 portions of fortification wall



Figure 6: After exposition of segment portion of the fortification wall

- Rain remained a problem factor as heavy rains during monsoon coupled with cyclonic or strong winds have led to damage of exposed cuttings.
- To prevent this, the exposed cuttings are required to be protected from the rain by a building a suitably designed shed over it. In the absence of a permanent shed to cover the trenches that had been excavated and the long stretch of the fortification wall, a temporary shed was built (see Figure 4 - Temporary shed for the protection of excavated remains during monsoon).

Strategies

The foremost strategy formulated; while exposing structural findings and the long stretch of the fortification wall, methods of the utmost significance were utilized. This included some of the missing sections of the brick fortification wall had to be consolidated immediately, and the excavated brick structures needed to be reinforced with similar material (Figures 5 - 6).

With this crucial strategy, the Excavation Branch V of the Archaeological Survey of India, Vadodara, was entrusted with the challenging task of commencing a large-scale excavation in a 4000 square meter area. The ultimate goal of the excavation was to transform the excavation site into an Experiential Museum that showcases an uninterrupted chronology of 2750 years of Vadnagar.



Figure 7: Deep section of walls excavated at Vadnagar during the 2017-18 field season

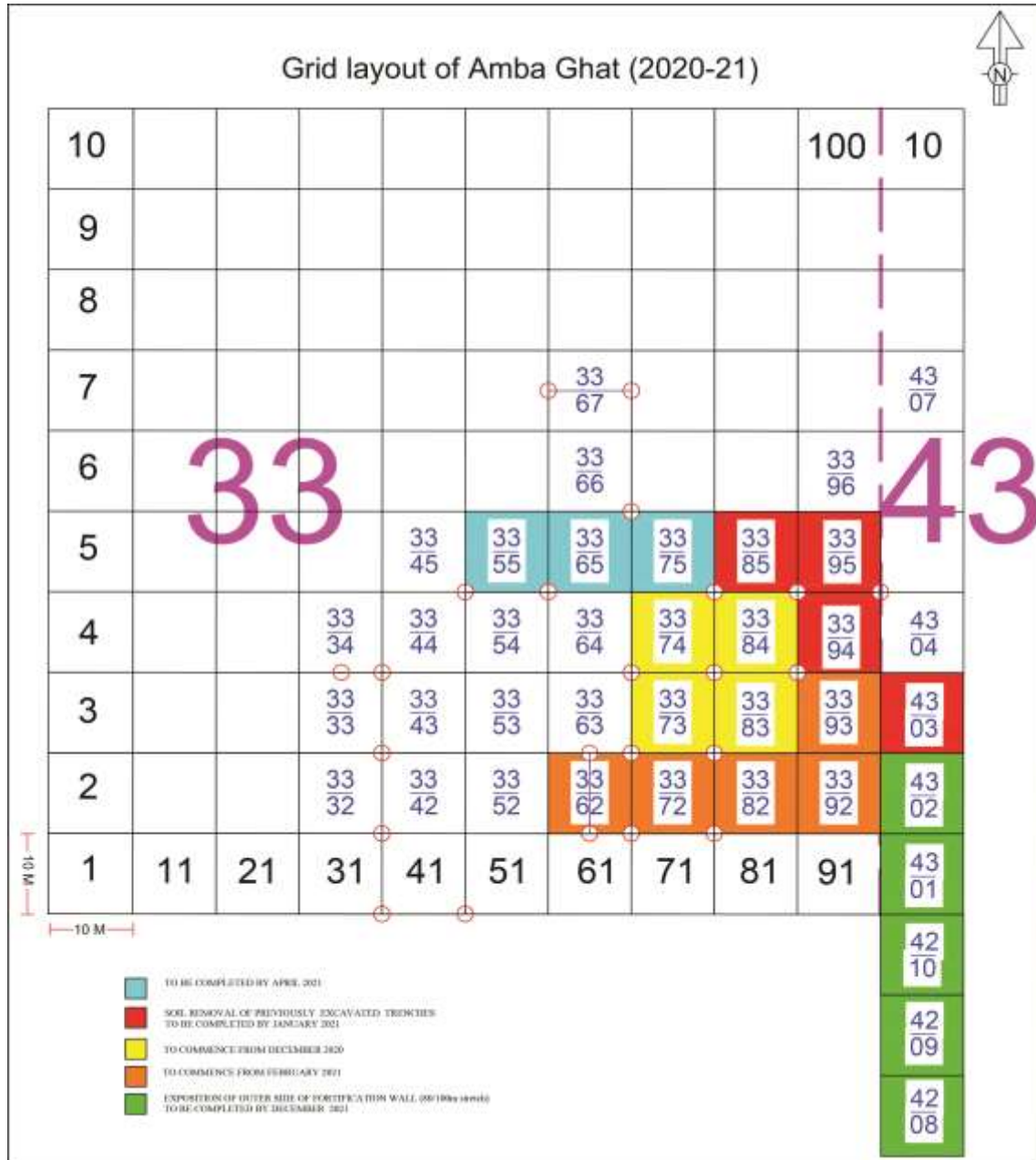


Figure 8: Layout plan consisting of 24 grids measuring 10 x 10 meters

To facilitate visitors in exploring the ancient settlement that is 2750 years old, an extraordinary design has been designed. This design allows visitors to descend into certain excavated areas and immerse themselves in the experience. One of the main challenges was excavating on a newly acquired 1-acre land, of which two grids had already been excavated up to a depth of 18 meters during the 2017–18 field season. Maintaining its deep section cutting posed a considerable challenge (Figure 7).

Another challenge was to protect the deep-cutting sections of excavated trenches from the unforeseen forces of nature such as heavy rainfall and storms, as the deposits are man-made, loosely bonded, and prone to collapsing.



Figure 9: Recycle of ancient material at Vadnagar



Figure 10: Recycle of ancient material at Vadnagar



Figure 11: simultaneous conservation of excavated structural remains

To surmount these challenges and magnificently present the excavated site, a strategic plan has been devised to achieve the goals, which are explained in the subsequent points:

1. The excavation was strategically planned in a stepped manner to minimize the depth of the cuttings and prevent any potential collapse of the section.
2. The excavation has been undertaken to prominently display seven successive cultural periods. A conceptual sketch was prepared to commence the excavating process accordingly.
3. After the land acquisition process was completed and the demarcated area transferred to ASI, a total of 24 grids measuring 10 x 10 meters were laid out and a plan of action was drawn up (Figure 8).
4. During excavation process, documentation and classification of cultural findings have also been taken up simultaneously by the Excavation Branch -V, ASI which has played significant roles for content writing and designing different galleries of upcoming proposed Museum in 3-acre land.
5. During the excavation, attempts were made to arrange the well-fired bricks in a stack and use them to conserve and restore the damaged sections of the brick structures.

6. Lastly, the archaeological excavation at Vadnagar has yielded remarkable results, making it a substantial contribution to the Discovery documentary titled “*Anat Anadi Vadnagar*”. The documentary was centered around the data, which included of excavation results, photographs, videos, and illustrations provided by the Excavation Branch V ASI Vadodara.

Recycle of Ancient Material for Conservation of Fortification

An innovative approach to recycling ancient materials has been devised for the major conservation of damaged parts of a fortification wall at Vadnagar. The major part of fortification wall along the Sharmistha lake at northern segment was found severely damaged up to the *ghat* area (*Hanuman Ghat*). Conservation work of this segment wherever possible with the limited resources available, has been taken up. In fact, entire northern portion witnessed the re-building of fortification wall during Sultanate – Mughal period. Thus, with a concept of recycling ancient material, bricks from old dilapidated houses of the town were assembled and used in the conservation work. Such kind of re-using of older bricks helps to maintain its original character with minimum intervention of the particular cultural period (Figures 9 and 10).

Conservation Approach Adopted and Recommendations

The adoption of contemporary approaches toward conservation and protection of archaeological excavated site at Vadnagar is found to have an important effect. Interventions/consolidation of excavated brick structures within and along the fortification with available trained and skilled workers of Vadnagar using traditional building materials as well as traditional practices was an integral part of the adopted conservation process at the site. While carrying out maintenance on regular basis and preventive conservation measures with utmost care of excavation site has facilitated prevention of further damage and deterioration to the excavated site. It has been observed that there is need to continuously maintain archaeological excavation site in such a manner, so as to preserve it for future generations. This would require retaining the site’s significance through regular monitoring in order to prevent any major unnecessary intervention in future. Such type of conservation is a continuous process and adequate resources (in the form of workers and financial nature) should be made available for conservation on a regular basis by the management of Archaeological Experiential Museum.

Conservation efforts (minimum interventions and used of tradition material) adopted at the site have retained its value, significance, authenticity, integrity and its visual connections to and from the site. Such measures which are adopted at the site facilitate to maintain a faithful representation of its original / historic appearance. The purpose of such conservation methods adopted have been found helpful to maintain its original state as was exposed during excavation (Figures 11-13).

Interventions such as restoration (veneered eroded exterior wall), consolidation (pointing done with potter’s clay and soil used for making brick), reconstruction

(missing portion of semi-circular bastion redone) and providing retaining wall (strengthening of weak exposed section) have been carried out carefully and meticulously merging it with the original fabric. All such interventions are reversible in nature and the processes undertaken have been duly recorded and documented for future use (Figure 14).



Figure 12: Simultaneous conservation of excavated structural remains

The entire process of conservation/consolidation have been documented (before, during and after conservation) through photographs, maps, drawings, digital recording and fortnightly reports to keep records of maintenance and interventions. Such documentation will be useful to understand all interventions for the future (Figure 15).

The original materials retrieved from old houses have been stacked for the purpose of conducting further conservation whenever it is required. Bricks retrieved from collapse of old houses are sturdy and having water retention capacity.

While carrying various measures for strengthening excavated and exposed brick structures authenticity of 'layers of history' have been maintained. To prevent erosion of talus deposit (deposit covering the outside of the fortification wall), landscaping with local grass have been made that provides a cleaner, dust free micro-environment, created comfortable space and has enhanced visual perception. Introducing landscape development along the exposed fortification wall using local grass and flora (*bougainvillea*) which requires least maintenance and are self-sustainable is noteworthy.



Figure 13: Simultaneous conservation of excavated structural remains



Figure 14: Consolidation of high-raised platform



Figure 15: Consolidation of excavated structures



Figure 16: Plan of exposed part of fortification wall

Measures Required to Maintain the Site for Posterity

1. The foremost is regular maintenance of the site employing skilled workers who have been trained by the ASI. The regular maintenance comprises of brushing using soft brushes, prevention of any vegetation growth, pointing with soft material (potter's clay) and removal of powdered brick to be replaced with brick retrieved from old houses and the excavation.
2. Section needs to be protected from birds building nests for which net can be used. Whenever cavity is formed, it needs to be filled with clay/mortar used in conservation immediately.
3. Suitable sunlight and cross ventilation need to be maintained.
4. Top portion of excavated remains (in case of earth) needs to be plastered with cow-dung/horse-dung mixed with clay on a regular basis.



Figure 17: Rampart and Moat



Figure 18: Long stretch of fortification wall - before and after



Figure 19: Consolidation of the exterior of fortification wall with traditional methods



Figure 20: Landscaping with local grass for a cleaner, dust-free micro-environment

5. Surface level of the deep cutting need to be paved with brick to prevent salt encrustation on the brick structure. Such paving bricks covering with clay will minimize salt encrustation on the free-standing excavated structure.

6. Any water leakage or monsoon rains over the excavated structure are harmful.
7. Damaged section needs to be strengthened with stone retaining covered with mud deposit.

Adaptation of Conservation Measures of Exposed and Excavated Structures

The untimely rains during the excavation have caused severe damage to the structures and exposed sections. Among them there was a breach of 6m x 3 m to the fortification wall. This breach has been conserved by relaying of ancient bricks and using traditional bonding material. The damage of the remaining exposed structures is also being attended to strengthen its bonding.

The image gallery showcases pictorial records depicting various stages of simultaneous conservation efforts for the unearthed structural remains and different segments of the uncovered fortification wall (Figures 16 – 20).

Conclusion

The archaeological excavation at Vadnagar, aimed at establishing an Experiential Museum, has presented both significant challenges and innovative solutions. The project, which spans over a site with 2750 years of continuous human occupation, required meticulous planning, adaptive strategies, and the integration of traditional and modern conservation techniques to preserve the integrity of the excavated structures. Despite interruptions caused by natural elements and the COVID-19 pandemic, the Archaeological Survey of India successfully navigated these hurdles by employing a range of conservation measures, including the recycling of ancient materials, strategic structural reinforcement, and the implementation of protective landscaping. The ongoing documentation and maintenance efforts underscore the importance of preserving this site for future generations, ensuring that Vadnagar's rich historical legacy remains accessible and intact. Through careful planning and execution, the project not only safeguards the archaeological heritage of Vadnagar but also offers a model for the preservation and presentation of similar historical sites worldwide.

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