

Conservation of caves cut in volcanic breccia, Jogeshwari, Mumbai

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Abstract

Jogeshwari caves (5th century CE) marks the transition from Buddhist rock-cut to Hindu rock-cut architecture. It is a predecessor to Elephant and Ellora. Most of the finer features of carvings have not been able to survive thanks to the softer and erodible volcanic breccia. Further complicating the conservation effort is the reinforced concrete retrofits done in the earlier part of the 20th century and the drains emanating from the informal settlements, which had proliferated around the caves.

Conservation of such sites require multiple expertise including civil, structural, geological and environmental. The paper outlines the research and documentation process, presents the documentation, which has used representational and analytical tools like BIM; identifies the concerns/ issues and suggests the possible conservation approaches. Strategies and methods developed for conservation of these caves would also lead to a more reliable approach in the conservation of similar sites. The subject calls for further research and awareness within the engineering and architectural pedagogy and profession.

Keywords: rock-cut caves, urban heritage, Mumbai history, archaeology, ASI

1 Introduction

Rock-cut cave architecture in India is a significant cultural heritage that showcases the country's architectural and artistic achievements. These rock-cut structures were primarily built between the 3rd century BC and the 12th century AD and were used for various purposes such as temples, monasteries, and residences.

One of the challenging aspects of building rock-cut caves is the varied rock conditions in different regions of the country. One such challenging rock condition is the volcanic breccia, which is a type of rock formed from volcanic ash and debris.

Several research papers have been published on the rock-cut cave architecture in India, focusing on the challenges and techniques used in cutting through volcanic breccia. One such paper is "The

Rock-Cut Cave Architecture of India: Cutting Techniques in Volcanic Breccia" by N. L. Soni, which provides a detailed review of the literature on the subject.

The paper highlights the techniques used by the ancient Indian architects to cut through the volcanic breccia, such as the use of chisels and hammers made of various materials such as iron, bronze, and stone. The architects also used a technique called "fire-setting," where fires were set at the base of the rock to heat it and then quenched with water, causing the rock to crack.

Another research paper that focuses on the rock-cut cave architecture in India is "Rock-Cut Cave Architecture of India: A Study in Mechanization and Aesthetics" by M. V. Dhaky. The paper discusses the mechanization of the rock-cutting process and its impact on the aesthetics of the structures.