

## ABSTRACT

The rapid urbanization of modern cities has led to increased demand for efficient public transportation systems. Underground metro stations play a pivotal role in addressing urban congestion, reducing environmental pollution, and enhancing connectivity. This paper explores the construction methodologies, planning considerations, and engineering challenges involved in the development of underground metro stations. Key aspects discussed include site selection, geotechnical investigations, excavation techniques such as cut-and-cover and tunnel boring, structural design, waterproofing, and safety measures. Special attention is given to minimizing the impact on existing infrastructure and the environment. Case studies from recent metro projects are analyzed to highlight best practices and innovations in construction technology. The study aims to provide a comprehensive understanding of the complex and multidisciplinary nature of underground metro station construction, with a focus on sustainability, cost-effectiveness, and urban integration.