

## Top-Down Construction Method in Concrete Structures: Advantages and Disadvantages of This Construction Method

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**Abstract :** The construction of underground structures using the traditional method, which begins with excavation and the implementation of the foundation of the underground structure, continues with the construction of the main structure from the ground up, and concludes with the completion of the final ceiling, is known as the Bottom-Up Method. In contrast to this method, there is an advanced technique called the Top-Down Method, which has practically replaced the traditional construction method in large projects in industrialized countries in recent years. Unlike the traditional approach, this method starts with the construction of surrounding walls, columns, and the final ceiling and is completed with the excavation and construction of the foundation of the underground structure. Some of the most significant advantages of this method include the elimination or minimization of formwork surfaces, the removal of temporary bracing during excavation, the creation of some traffic facilities during the construction of the structure, and the possibility of using it in limited and high-traffic urban spaces. Despite these numerous advantages, unfortunately, there is still insufficient awareness of this method in our country, to the extent that it can be confidently stated that most stakeholders in the construction industry are unaware of the existence of such a construction method. However, it can be utilized as a very important execution option alongside other conventional methods in the construction of underground structures. Therefore, due to the extensive practical capabilities of this method, this article aims to present a methodology for constructing underground structures based on the aforementioned advanced method to the scientific community of the country, examine the advantages and limitations of this method and their impacts on time and costs, and discuss its application in urban spaces. Finally, some underground structures executed in the Ahvaz urban rail, which are being implemented using this advanced method to the best of our best knowledge, will be introduced.

**Keywords :** top-down method, bottom-up method, underground structure, construction method

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