

**Stability & Risk Assessment Analysis for Deep Excavations – A
review paper**

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The rapid increase in underground construction has made deep excavation a necessity, presenting numerous challenges in terms of stability and associated risks. This study discusses these challenges based on the latest research findings. Finite Element Analysis is utilized to calculate safety factors for stability checks, while examining the relationship between excavation conditions and soil behavior, proposing a rigid block rotational failure mechanism. Another method explored is the Pipe Curtain method, which evaluates excavation stability under varying reinforcement types. A fitting accuracy of over 0.9 indicates improved stability in excavations. Soil arching techniques are employed in strutted excavations to optimize stability. Risk assessment and management are crucial aspects of deep excavations, considering the inherent dangers to human lives during construction. Dynamic risk assessment is emphasized, involving a model that selects risk factors to identify and mitigate instability throughout the project lifecycle. This methodological approach serves as a vital tool for ensuring the protection and control of instability-related disasters in deep excavation projects.