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# Effect of Preloading on Long-Term Settlement of Closed Landfills: A Numerical Analysis

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**Abstract :** In recent years, by developing cities and increasing population, reconstructing on closed landfill sites in some regions is unavoidable. Long-term settlement is one of the major concerns associated with reconstruction on landfills after closure. The purpose of this research is evaluating the effect of preloading in various patterns of height and time on long-term settlements of closed landfills. In this regard, five scenarios of surcharge from 1 to 3 m high within 3, 4.5 and 6 months of preloading time have been modeled using PLAXIS 2D software. Moreover, the numerical results have been compared to those obtained from analytical methods, and a good agreement has been achieved. The findings indicate that there is a linear relationship between settlement and surcharge height. Although, long-term settlement decreased by applying a longer and higher preloading, the time of preloading was found to be a more effective factor compared to preloading height.

**Keywords :** preloading, long-term settlement, landfill, PLAXIS 2D
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