Deep Dynamic Compaction of MSW landfills

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Abstract

There are numerous active and abandoned waste sites in the US and worldwide. Post-closure development of these sites is desirable from an environmental, societal and economical perspective. However, the post-closure development of landfills presents many challenges. A major challenge is the generally soft nature of the municipal solid waste (MSW) and the high potential for significant differential settlements. To reduce the amount of total and differential settlement, a number of ground improvement techniques have been used in practice, including grouting, pre-compression, and deep dynamic compaction. In Deep Dynamic compaction, a weight is repeatedly dropped from a certain height, compressing the waste and inducing settlement in the waste mass. The technique has been used in many MSW landfills. These case histories indicate that the technique results in a stronger waste structure and less expected settlement.

Mike Flanagan, a recent (2009) MSc graduate of the geotechnical program at the University of Michigan will present the results of an independent study that he performed. The study analyzed the data from a total of 64 landfill case histories using the deep dynamic compaction. The lessons learned from these case histories are systematically studied and aggregated to provide some guidance with respect to the performance of the technique. Guidance with respect to the expected depths of improvement in waste, as well as the expected induced settlements is provided.