



### **Landfill Engineering: Waste/Barrier Interaction**

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The growth of urban centres brings with it an increase in population who in turns creates household solid wastes that must be stored. A landfill site in engineering term is a site for disposal of waste materials by burial. It is a form of waste management. The scarcity of urban lands heightens the importance of treating the waste materials.

Professor Dr. Neil Dixon from Loughborough University, United Kingdom was invited to deliver an evening talk on “Landfill Engineering: Waste/Barrier Interaction”. The talk was jointly organised by IEM’s Geotechnical Engineering Technical Division (GETD) and International Geosynthetics Society (Malaysia Chapter), attended by 43 participants.

#### ***Stability and integrity***

The talk focused more on municipal solid waste (MSW) landfill.

First, in the design of a landfill one has to consider within and between elements of the lining system including geosynthetic materials, the waste and the subgrade. This is related to the large scale movement of landfills which may result in complete loss of stability.

Second, the design must consider the integrity of lining system, which deals with small scale movement to ensure no loss of function. Therefore, stresses and deformations in both mineral and geosynthetic lining materials must be controlled to ensure preferential flow paths for leachate and gas are not formed during the life of the landfill facility.

By using some photos, Professor Dr. Neil Dixon explained landfill failures associated with stability and integrity issues.

#### ***Engineering behaviour***

Dr. Dixon moved on to discuss the engineering behaviour of MSW landfills in detail as the waste was a part of structural component of a landfill.

MSW can be analysed and classified systematically like soils do in geotechnical engineering testing: pressure meter test; shear box test; and large compression test, etc. However Dr. Dixon argued that obtaining waste parameters (e.g., compressibility, shear strength) for

landfill design presented a number of challenges especially on the degradation of waste which was most difficult to quantify.

Be it as it may, Dr. Dixon presented several slides showing engineering quantification and classification of waste was possible. He then discussed the interaction of the lining system and waste on steep slopes and shallow slopes based on the research from field measurements. Dr. Dixon also showed that numerical modelling techniques could be used to assess the integrity of lining components and stressed the importance of instrumentation to assess the performance of the lining systems.



Prof. Fauziah from International Geosynthetic Society (Malaysia Chapter) presenting memento to Prof. Neil Dixon after the evening talk.