

## Case studies of Advanced Construction and Demolition waste(CDW) Recycling initiatives and technologies In JAPAN

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Title	<b>Slope stability and bearing capacity of landfills and simple on-site test methods</b>	
Theme classification	<input type="checkbox"/>	Prevention
	<input type="checkbox"/>	Re-use
	<input type="checkbox"/>	Recycle
	<input type="checkbox"/>	Reduce Co2
	<input type="checkbox"/>	Legacy
	<input type="checkbox"/>	Business to overseas
	<input type="radio"/>	Etc.
Technology development stage	<input type="radio"/>	Practical use
	<input type="checkbox"/>	Scheduled to be put into practical use by 2020
	<input type="checkbox"/>	Scheduled to be put into practical use after 2020
Specific content	<p>- According to the past study, it was grasped that the waste landfills mixed with plastics, etc. had tensile resistance exerted by fibrous materials such as plastics, etc. and large frictional resistance caused by engagement of large and small wastes, etc., and the slope stability was extremely high.</p> <p>-However, many construction companies believe that such waste landfills cannot used as be soft. Therefore, It is almost impossible to use it as a ground for installing a heavy structure at the disposal site.</p> <p>- In addition, since the individual size of waste is much larger than that of soil, it is difficult to apply the conventional indoor soil test method to the strength test.</p> <p>- Against this background, in FY2013-FY2015,with the support of the ministry of environment's Subsidy for Promotion of Comprehensive Environmental Research, We studied the strength characteristics such as the supporting capacity of waste landfill sites contaminated with plastics etc. and the mechanical test method etc and clarified basic ground strength characteristics and proposed on site test method.</p> <p>- In addition, this on site test method was applied to a large-scale waste slope collapse site in Sri Lanka, and the usefulness was confirmed even in waste landfills outside Japan.</p>	
Appeal point	<p>- In August 2017,We participated in "Field Survey for Safety Assessment of Slope Safety of Waste Disposal Site Meethotamulla Sri Lanka Country" by the Japan International Cooperation Agency (JICA), and provided technical support by this on site test method at this large scale collapse site.</p> <p>- We provided the strength data of the waste layer to Sri Lanka · National Institute for Building Research and provided technology on a series of strength testing methods.</p> <p>- Large-scale slope collapse occurs frequently at waste disposal sites in heavy rain areas such as Southeast Asian countries, and technology transfer of this on site test method can be expected.</p>	

## **Slope stability and bearing capacity of landfills and simple on-site test methods**

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This study discusses strength characteristics (slope stability, bearing capacity, etc.) of waste landfills through on-site tests that were carried out at 29 locations in 19 sites in Japan and three other countries, and proposes simple methods to test and assess the mechanical strength of landfills on site. Also, the possibility of using a landfill site was investigated by a full-scale eccentric loading test. As a result of this, landfills containing more than about 10 cm long plastics or other fibrous materials were found to be resilient and hard to yield. An on-site full scale test proved that no differential settlement occurs. The repose angle test proposed as a simple on-site test method has been confirmed to be a good indicator for slope stability assessment. The repose angle test suggested that landfills which have high, near-saturation water content have considerably poorer slope stability. The results of our repose angle test and the impact acceleration test were related to the internal friction angle and the cohesion, respectively. In addition to this, it was found that the air pore volume ratio measured by an on-site air pore volume ratio test is likely to be related to various strength parameters.

### **References**

Atsushi Yamawaki, Yoichi Doi and Kiyoshi Omine; Slope stability and bearing capacity of landfills and simple on-site test methods; *Waste Management & Research*, vol. 35, Issue 7, pp.730-738, (2017)