

Cost Savings With Geosynthetics

IN these challenging times, developers are looking for ways to minimise their construction cost. One of this may include the use of geosynthetics, either in the textile form or various other forms.

Although geosynthetics is not new to Malaysia, the industry remains a hot topic for research and development. Engr. Dr Loke Kean Hooi, MIEM, P. Eng., General Manager of TenCate Geosynthetics Asia Sdn Bhd, a subsidiary of Royal TenCate, is a specialist in this area. He shares his thoughts on the potential of the industry.



What are the advantages of using geosynthetics compared to conventional construction methods?

For the past 30 years, various worldwide researches have proven that construction using geosynthetics is much more economical both in the short and long term. In the latter, geosynthetics has been proven to speed up the construction process. Conventional methods of construction are more time consuming due to construction delays.

In the long term, geosynthetics helps prolong the life of a structure. For example, instead of resurfacing a road every three years, it can be done every six years instead. So from a client's perspective, this translates into more cost savings.

Another example on the benefits of using geosynthetics is during the construction of slopes. If a developer wants to stabilise a slope, the conventional method would be to build a retaining structure, which translates into high short term cost. However, with geosynthetics, the short term cost is negated by the long term savings in the form of the durability and design life of the structure if designed properly.

If a developer wants to develop an area but find it unsuitable because the ground condition is very poor, the conventional method is to dig everything out and remove all the unusable material. This method is not only very costly, it is also completely impractical and no longer practised nowadays.

Another conventional method still in practise for those who are unaware of geosynthetics is to fill good material on top of poor soil material. This is called the displacement method. It is so called because the good soil will sink in and displace the poor soil. This method also requires a lot of effort and inflates the cost. In addition, the mobilisation of construction could be a potential problem.

To stabilise very soft ground using geosynthetics, a geotextile layer should be unrolled directly onto the poor soil. This will provide a separation piece of material directly on top of the poor soil. So when a developer fills

the good soil on top, the good material will not sink into the poor soil. As a result, he saves on the amount of good material he needs and other construction material.

By using the geotextile as a separator, a contractor can be assured that the geotextile retains the fill material he puts it, which is good enough. He can then get on with other ground improvement work. This method is economical, viable and helps reduce downtime.

Which industry benefits most from this technology and how?

Contrary to popular belief, the use of geosynthetics is no longer confined to the field of civil engineering. It has spread to many areas of application, particularly in the area of environmental engineering.

For example, geosynthetics is being used at landfill projects to prevent leachate from contaminating the ground. In the past, leachate goes into the soil and contaminates the water table. This is harmful to the environment. Geosynthetics is also used for soil erosion control, to prevent the erosion of soil due to river flow or wave action at the sea.

Although the majority of geosynthetics is utilised by the civil engineering field, which I roughly estimate to be about 75%, its application in environmental engineering is certainly growing. In fact, there is a big potential for geosynthetics in Malaysia. One of this could even be the agriculture industry.

Could you share one example on the best use of geosynthetics?

Geosynthetics is often used for rehabilitating a fail structure such as a failed slope. By using geosynthetics to stabilise a slope, a developer can build on a steeper slope than currently allowed.

Needless to say that such development will require proper design. The developer will also need to take into consideration other factors such as the long term behaviour

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