

Trailblazing project on major Kent road scoops awards

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Highways Agency

A new technique to strengthen road embankments using electricity, carried out on the A21 in Kent, has won two prestigious industry awards.

The pioneering Highways Agency-led project picked up the Innovation Award at the Institution of Civil Engineers' (ICE) regional Excellence awards, and won recognition at the annual Green Apple awards for its environmental benefits.

The technology used, known as Electrokinetic geosynthetics or EKG, can deliver significant environmental advantages over traditional methods, by minimising vegetation clearance and reducing carbon emissions; it also has benefits for road users because it can avoid the need for restrictions on the road while work is carried out.

The judges at ICE hailed the project as an 'innovative solution ... preserving the environment and minimising disruption to motorists and local residents', while the Green Apple award's judging panel commended the projects 'pioneering' nature and the potential for its application in other projects.

Work started last autumn on the project, to strengthen an embankment on the A21 at Hildenborough near Tonbridge, and was the first time the technique had been used for this purpose in the UK. It was completed in February.

Highways Agency geotechnical expert Jan Marsden said:

"Our regular inspections showed some embankments along the A21 had been starting to lose structural strength and we needed to stabilise them to prevent them causing damage to the road in the future. This particular section had many mature trees which local people were, understandably, keen to retain, and is a rich wildlife habitat. So, we decided Stocks Green would be a good place to try this new technology out.

"Although the principles of electroosmosis have been known for more than 200 years it has taken some time to develop a process which is suitable for our purposes, marrying the physics with modern materials and innovative design and application. This is the first time in the UK that it has been used on a major road, and I am delighted that its potential benefits have been recognised in this way."

Traditionally, embankment strengthening involves clearing the slope of vegetation, and requiring lanes to be closed on the road while heavy equipment is used to strip loose soil from the embankment surface and compact the earth beneath, before soil nails are installed to hold the slope in place.

EKG uses an electric current to strengthen the soil in the slopes. Special EKG anode nails and EKG cathode drains were installed in the embankment, amongst the existing trees, and had an electric current applied to them. The ensuing electroosmotic flow removed moisture from the ground thus improving the strength of the bulk material and increasing the bond between the anode nails and the soil. The anodes were then converted into nails by installing a reinforcing tendon, which was grouted in the conventional way.

The embankment stabilisation produced zero waste and reduced the carbon footprint of the works by 40% compared to the alternatives available. Initial indications suggest that EKG stabilisation offers a cost saving of approximately 30% compared to conventional soil nailing.

The technique is now being used at a second site on the M5 in Worcestershire, using much of the same equipment. The effectiveness of the system is being monitored to assess its suitability for other sites in the future.

Notes to Editors

1. The Highways Agency is an executive agency of the Department for Transport. We manage, maintain and improve England's motorways and trunk roads on behalf of the Secretary of State.

2. The A21 slope stabilisation project was carried out by Interserve Construction Ltd, managed by Balfour Beatty Mott MacDonald, on behalf of the Highways Agency. The EKG design and materials were provided by specialist subcontractor Electrokinetic Ltd.

3. The ICE South East England Engineering Excellence Awards were held on Friday 22 June at Leeds castle in Kent. In making the awards the judges commented:

"[We] were impressed by the innovative solution adopted by the project, the first time the technique has been used in the UK. The scheme managed to retain the landscaping in the vicinity of the scheme, minimised waste and removed the need for traffic management; preserving the environment and minimising disruption to motorists and local residents."

For more information on this award, go to www.ice.org.uk/near-you/uk/south-east-england

4. The 2012 Green Apple awards were held on Monday 25 June at Canary Wharf, London. The judges commented:

"Stocks Green was pioneering in its nature and trail blazing in its ability to be replicated when carrying out similar projects. It is one of the most important things for the judges that projects like this can be held up as the very best in best practice with the hope that others can adopt and deliver."

For more information on this award, go to www.thegreenorganisation.info

5. Real-time traffic information for England's motorways and other strategic roads is available:

- From the web at www.highways.gov.uk/traffic or www.highways.gov.uk/mobile if using a phone or mobile device.
- By phone from the Highways Agency Information Line on 0300 123 5000 at any time. (Calls to 0300 numbers will cost no more than 5p per minute from a standard BT residential landline. Call charges from other landlines and mobile networks may vary, but will be no more than a standard geographic call and will be included in all inclusive minutes and discount schemes). Make sure it's safe and legal before you call. Before using any mobile, find a safe place to park. Never stop on the hard shoulder of a motorway except in an emergency.
- On an iPhone app which will automatically select the region you are in. Free to download from the iTunes store or search for Highways Agency on your device.
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