





Case Study

Tree-root protection
beneath access road



Project: Farnborough Central housing estate
Client: Redrow Homes (Southern) Ltd
Contractor: John Reilly Civil Engineering Ltd
Distributor: Keyline
Product(s): TERRAM™ 1000 geotextile & Geocell 25/15

Tree-root protection is a complication that many developers have to deal with as they seek to provide cost-effective housing whilst preserving the surrounding environment.

Redrow Home's housing project, Farnborough Central, is located within 2.5km of the Thames Basin Heaths Special Protection Area (SPA). Recommendations in a detailed arboricultural study of the site meant that Redrow had to use a non-invasive solution for the construction of many of the site's roads in order to protect trees placed under a Tree Protection Order (TPO) as part of the planning approval by Rushmore Borough Council.

Standard practice for constructing traffic-bearing surfaces involves excavating to allow the installation of a sub-base that will adequately support traffic loads. Unfortunately this method of construction can badly damage trees as a result of root severance.

Trees are extremely sensitive to disturbances in the soil surrounding their roots. Contrary to popular belief, trees do not have long roots going deep into the soil but rather have lots of relatively small roots which spread out from the tree very close to the surface and for some distance. About 80-90% of all tree's roots are in the upper metre of soil and even if relatively-small roots are severed by construction

activity then the tree can begin to suffer symptoms of drought stress as it is no longer able to obtain all its water needs.

The rootzone can also become distressed if it is compacted by vehicles repeatedly traversing the ground. The effect is to close up the soil pores which would otherwise provide air and water. The roots begin to suffer and, as the soil becomes denser, they find it hard to penetrate the soil. All of these problems can cause the root system to die back and inevitably this has an adverse affect on the tree itself.

The raising of soil levels has a similar damaging effect as it deprives roots of oxygen and creates a build up of harmful carbon dioxide around the roots.

Redrow's answer to root protection for their Farnborough scheme came in the form of an above ground, no-dig method of construction using a TERRAM geocell.

Conforming to recommendations within the British Standards Institution BS5837 Trees in Relation to Construction and the Arboricultural Advisory and Information Service's practice note APN12 in relation to constructing driveways close to trees, the use of a TERRAM geocell enabled Redrow to carry out

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construction work within the specified root protection areas of the development which would not have been permitted using traditional construction techniques due to the unacceptable levels of soil disturbance and root damage caused by such methods.

A TERRAM geocell is a tough and flexible cellular structure, designed to provide even load distribution and a stable traffic base for the site with loads of up to 300kN/m² revealing only minimal deflection (<5mm) of the surface of the filled cells. TERRAM geocells are fabricated from a geotextile which is permeable, allowing lateral movement of air and water.

Installation proved simple and highly effective. Each of the areas to be protected were cleared of vegetation and the upper layer of soil was removed by hand to limit any possible soil compaction. A layer of TERRAM 1000, a permeable geotextile, was laid over the area to prevent any imported fill from penetrating the soil. The geocell was opened out, secured in position on top of the geotextile and the cells were filled with an aggregate. A permeable wearing course was then placed on top of the geocell. A second layer of TERRAM 1000 was placed over the geocell in areas where block paving/sharp sand was installed.



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Fiberweb Maldon, Fiberweb Geosynthetics Ltd.
Blackwater Trading Estate • The Causeway
Maldon • CM9 4GG • United Kingdom
Tel: +44 (0) 1621 874200 Fax: +44 (0) 1621 874299
e.mail: info@terram.com • www.terram.com

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