

Case Study

Cellweb® TRP

69 Church Lane, Oakley, Bedfordshire



Location:

69 Church Lane, Oakley,
Bedfordshire

Project Description:

A driveway to a new development,
passing through a wooded area.

Technical Requirements:

- To overcome a natural change in levels of in excess of 1m within the RPA.

Consultant:

RGS Tree consultants



Contractor:

Larkin Homes



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Stacking Cellweb for Driveway Construction

69 Church Lane, Oakley, Bedfordshire

Introduction

In spring 2016 Geosynthetics Ltd were contacted by Robert Yates of RGS Arboricultural Consultants regarding a new driveway at a development in Oakley, Bedfordshire. The proposed route for the drive passed through a wooded area and therefore through the root protection areas (RPAs) of numerous trees which were to be retained. In order to maintain the health of the retained trees a no dig drive would need to be constructed.

The Cellweb® Tree Root Protection system is specifically designed for the construction of new hard surfaces within RPAs. It is constructed on the existing ground surface, removing the requirement for excavation and preventing root severance. The system allows continued water permeation and gas exchange by confining an open graded clean angular stone infill material. The system is also extremely effective at spreading point loads and reducing the load that is applied to the soils beneath. This in turn minimises soil compaction maintaining an open soil structure which allows continued gas exchange, water permeation and migration.



Photo 1: Level area before preparation or installation

Geosynthetics Cellweb® TRP Technical Specifier met on site with Robert Yates of RGS Arboricultural Consultants and contractor, Warin Larkin of Larkin homes. As can be seen in photo 1, most of the proposed route was over level ground which would lend itself to a relatively simple specification and installation, utilising a single layer of the Cellweb® Tree Root Protection system.

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Photo 2: Hollow area (highlighted) before ground preparation and installation

Photo 2 shows what will become the entrance to the drive way where a section of the existing hedge will be removed, opening out onto the highway. It can be seen that this portion of the proposed driveway contains a significant fall in levels resulting in a large hollow. Within this hollow sits the RPAs of several retained Horse Chestnuts and a large yew. As a rule of thumb a single layer of the Cellweb® TRP system should not be laid on a gradient greater than one in ten. The client had also requested that the driveway was to be level, and these factors combined meant that the hollow would need to be infilled. Due to the presence of RPAs this would need to be achieved using a technique whereby the Cellweb® TRP system would be stacked or layered in the hollow to achieve the required build up.

During the site meeting Larkin Homes measured the depth of the hollow at its deepest point and the span of the hollow at its widest point. The remaining area of level driveway was measured and information on the proposed traffic loadings was obtained. This information was then provided to Geosynthetics in-house engineering department so that they could prepare site specific recommendations for the driveway build up.

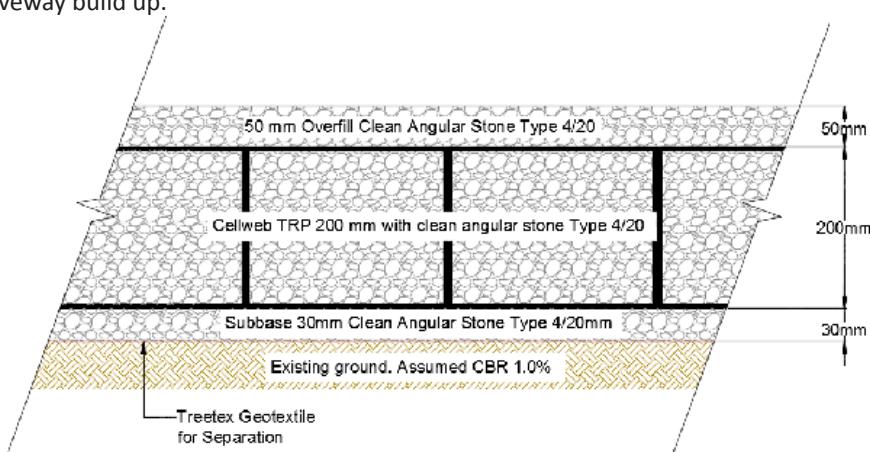


Diagram 1: Recommended build up for the level section of the driveway

The engineering team at Geosynthetics prepared two recommendations, one for the hollow section of the driveway and another for the remaining level section. Diagram 1 above shows the recommended build up for the level section of the drive way. The 200mm depth Cellweb® was recommended based on the proposed traffic loadings which were provided and an assumed California Bearing Ratio (CBR) value of 1%. Actual CBR values for the site were unknown.

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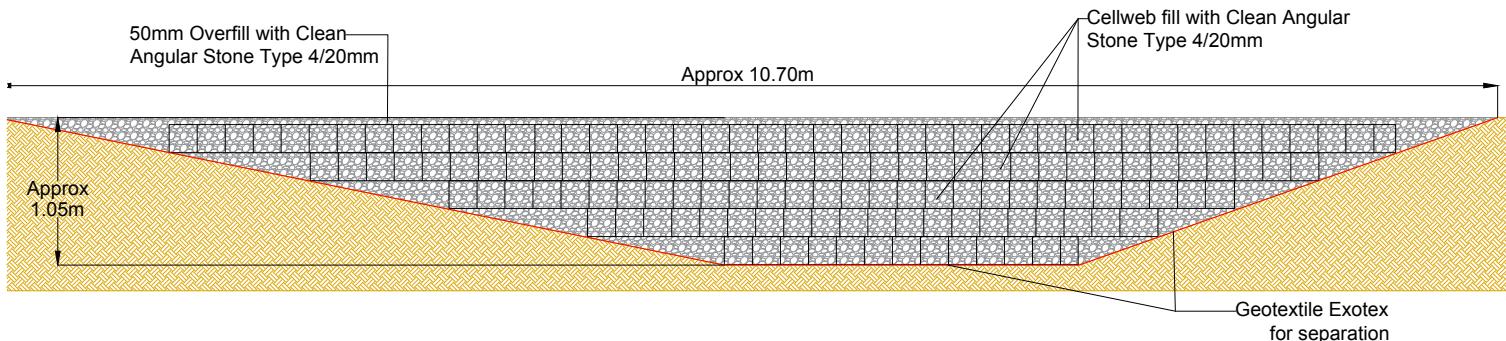


Diagram 2: Recommended build up to infill the hollow section

Geosynthetics in-house engineers also provided a longitudinal section (diagram 2) which provides an indication of how Cellweb® TRP could be layered to achieve the required build up and infill the natural hollow in the proposed route for the driveway. This could be achieved using five layers of 200mm deep Cellweb® TRP.

Having produced the drawings Geosynthetics were able to provide approximate quantities of materials required for both the level area and the hollow infill. Based on this information the Cellweb® TRP internal sales team were able to produce a quotation for materials delivered to site. Both the technical recommendations and the quotation were sent to Warin Larkin of Larkin Homes. Geosynthetics also provided a stone specification to enable Larkin Homes to source the correct stone.

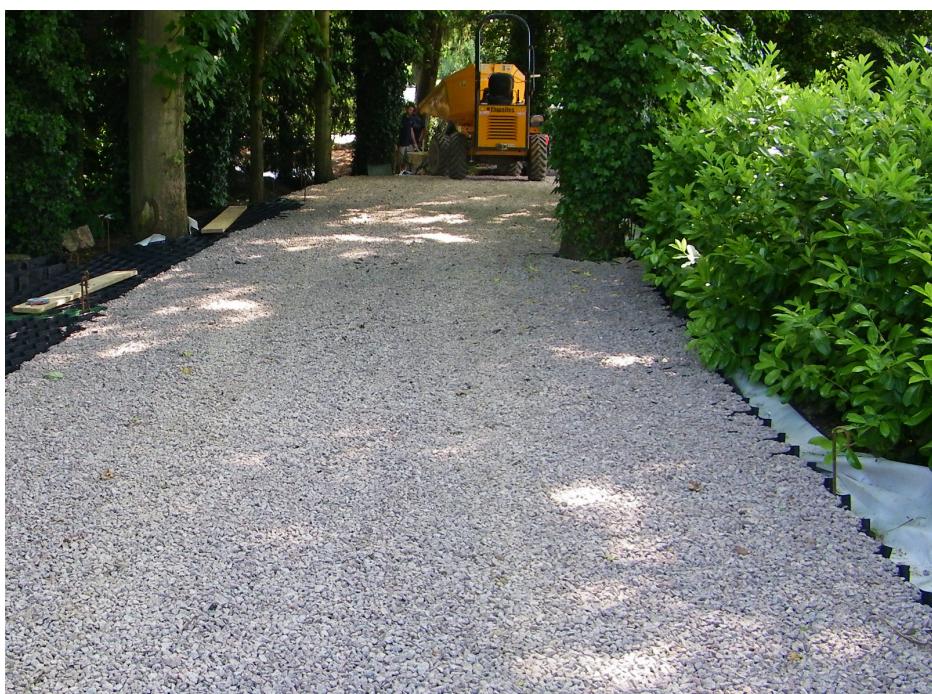


Photo 3: Installation of the level section

On delivery of the materials Larkin Homes began the installation of the new driveway, working from the new development towards the existing highway. As can be seen in photo 3 the level part of the new drive was installed first.

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Photo 4: Minor excavation to install the first layer of Cellweb® TRP

Having installed the flat section of the drive, the installation had reached the hollow. It can be seen in photo 4 that in order to prepare the bottom of the hollow for the first layer of Cellweb® TRP some minor excavation was carried out. This created a flat and level surface on which the installation could begin. This was done under the supervision of RGS Tree Consultants who ensured that there was minimal root disturbance.



Photo 5: Pegged Cellweb® being filled by hand

Photo 5 shows the first layer of Cellweb TRP being installed onto the prepared hollow bottom. The area was first lined with Treetex geotextile which acts as a separation layer and a pollution control measure, in accordance with BS 5837 2012. The Cellweb® was then pegged out over the top. This was then infilled by hand, as it was surrounded by unprotected RPA, which meant that no plant could be tracked through at this stage.

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Photo 6: Layering of the Cellweb®TRP

It can be seen in photo 6 that the 200mm thick layers of Cellweb® are stacked on top of one another in order to achieve the required build up. By offsetting each panel by one cell a terraced or stepped effect has been achieved. The Cellweb® requires no retaining structure and the outer Cells can be emptied of stone and infilled with topsoil. Soil can then be banked up the Cellweb® terraces and can be seeded to create a vegetated bank. This is a simple but effective method of hiding the exposed Cellweb®.

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Photo 7: Showing 5 layers of 200mm Cellweb®

Conclusion

Photo 7 shows the completed hollow section of the drive. This consists of five layers of 200mm Cellweb® TRP and demonstrates clearly how a build up to overcome natural changes in levels can be achieved. This method has ensured that there has been only minimal excavation, preventing root severance. The Cellweb® TRP infilled with an open graded clean angular aggregate ensures continued water permeation and gas exchange between the atmosphere and the rooting environment.

For advice on the construction of any form of hard surface through root protection areas please contact Geosynthetics on 01455 617 139.

"Thank you for the support you provided on the Tree Root Protected driveway at 69 Church lane. These projects are always challenging so we were delighted with the level of knowledge your team had to offer from the initial meeting with your representative to the staff in the office. Furthermore the purchasing process was straight forward, delivery was on time and the product was both high quality and easy to use."

We would definitely recommend Geosynthetics and the Cellweb® TRP system and look forward to working with you again in the future."

Larkin Homes