

TENSARTECH® GREENSLOPE

EARTH RETAINING SYSTEMS FOR SLOPES



➤ Tensor® Technology – proven, practical solutions and the know-how to get them designed and built.

Tensor Technology is widely adopted for Pavement Optimisation and Subgrade Stabilisation to improve the structural performance of paved roads and unbound roads and platforms. Tensor Technology is also adopted for Earth Retaining Systems for cost effectiveness and versatility over other traditional methods. By delivering real savings in cost and time, Tensor Technology can help you improve the bottom line on your project as well as preserving the invested capital.



Building in Confidence with the TensorTech® GreenSlope Earth Retaining System

The result of over 30 years of evolution in construction techniques, the TensorTech GreenSlope Earth Retaining System is used for building soil structures with a slope face angle up to 70°. By specifying TensorTech GreenSlope, the engineer and client are selecting a system which is both economical and attractive for steep slope construction.

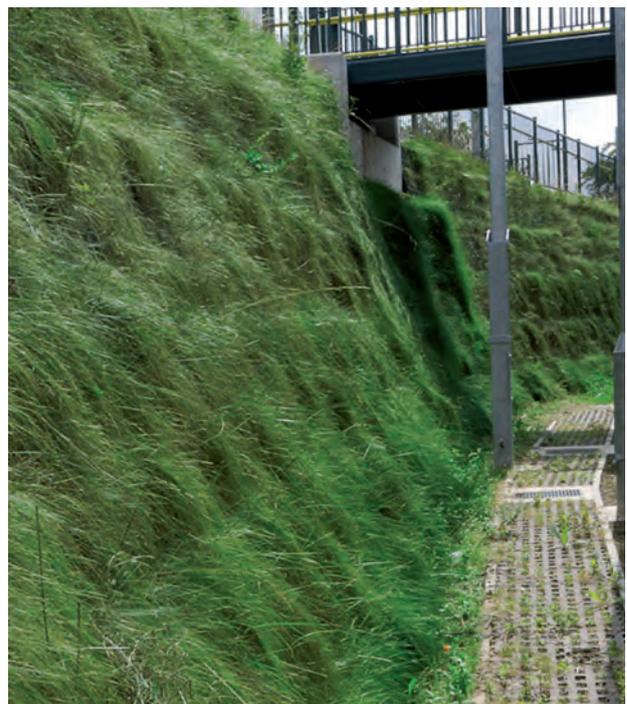
The stability of the structure is provided by the geogrid reinforced soil mass with durable steel units positively connected at the face using Tensor's high efficiency bodkin connection. The facing units are lined during installation with an appropriate erosion mat, which will help establish the chosen vegetative cover to the slope, whether that be suitable ground cover, climbing plants or simply grass.

The facing units are delivered to site, stacked and tied, ready to be lifted into position. During installation the appropriate geogrid is connected using the Tensor bodkin. Brace bars are then fixed into position to hold the face at a constant angle allowing the easy placement of topsoil and structural fill behind the face.

Alignment is simplicity itself with no need for the costly and time consuming formwork necessary to maintain accurate alignment when using techniques such as wraparound.

The designer is able to choose a continuous 70° slope face structure or a terraced structure with step-backs built into the face to allow irrigation of the chosen vegetation at the face.

Typically structures such as these have a design life of up to 60 years. However, designers may rest assured that there are Tensor geogrids available, providing the core stability, which have been independently assessed and certified for use in structures with a design life up to 120 years in the most demanding situations.





TensarTech GreenSlope for Proven Construction of Structures for Highways, Infrastructure or any Building Development

The cost effectiveness and versatility of the TensarTech GreenSlope offers clients, specifiers and contractors many advantages over other traditional methods, such as reinforced concrete. For the construction of retaining structures, TensarTech GreenSlope is generally considered more attractive than gabions or crib walling.

- ▶ A low cost earth retaining structure at a fraction of the cost of a reinforced concrete solution
- ▶ Rapid and economical construction procedure
- ▶ Often no specialist construction skills necessary
- ▶ Simple to build using established earth embankment construction techniques
- ▶ Allows possible use of site won fill including cohesive or contaminated materials
- ▶ Can be designed using BBA certified geogrids
- ▶ Tolerant to differential settlement
- ▶ Helps maximise land-take more economically
- ▶ High resistance to earthquake loading
- ▶ Low bearing pressure may avoid expensive foundation treatment
- ▶ Ready for immediate use upon completion



Construction using standard equipment and materials keeps cost and time to a minimum.



With construction successfully completed, the TensarTech GreenSlope can be prepared for the vegetation stage.



By selecting the vegetation to suit local conditions, the TensarTech GreenSlope will be attractive and low maintenance.

Independent Assessment and Approval

HAPAS (Highway Authorities Product Approval Scheme) was set up in 1995 to establish a nationally recognised approval scheme for innovative products and systems used in highway works. Successful HAPAS assessment results in the issue of a Certificate or Report which provides highway engineers with product performance, design and installation data invaluable to the product choice and project planning processes.

Selected Tensar geogrids have been awarded HAPAS approval allowing their design and specification in highways structures and bridge abutments with a 120 year design life and also a 120 year design life for strengthened embankments. The BBA certificates are evidence that the certified Tensar geogrids have been evaluated independently as fit for their intended use.



TENSAR RE AND RE500 GEOGRIDS FOR REINFORCED SOIL EMBANKMENTS



TENSAR RE AND RE500 GEOGRIDS FOR REINFORCED SOIL RETAINING WALL AND BRIDGE ABUTMENTS

Unsurpassed Experience and Reliability

Tensar International is a world leader in geogrid technology and the provision of high performance reinforced soil solutions, with over 30 years experience. Many thousands of reinforced soil structures, in many varied geotechnical and climatic conditions, have been designed and built using Tensar Technology around the world.

Independently Assessed and Approved Offering Cost Effectiveness and Versatility

Savings of up to 75% over conventional construction methods such as reinforced concrete can be achieved by constructing with the TensarTech GreenSlope System. In addition construction time may also be significantly reduced.



Steel facing units are securely connected to the geogrid reinforcement.



As vegetation becomes established the durable steel units begin to blend in with the landscaping offering an attractive alternative to traditional retaining walls.

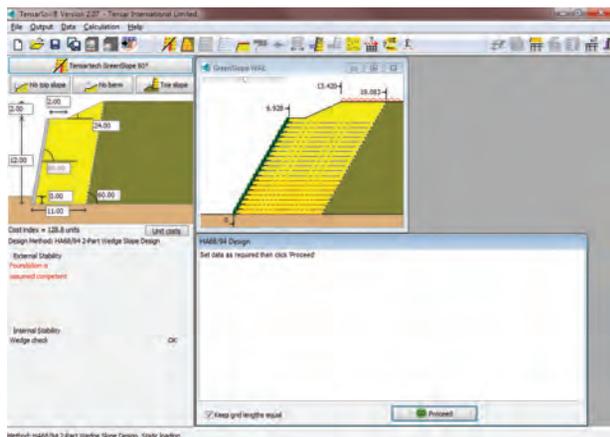
Many TensarTech GreenSlope Systems are in Service - A Proven Success



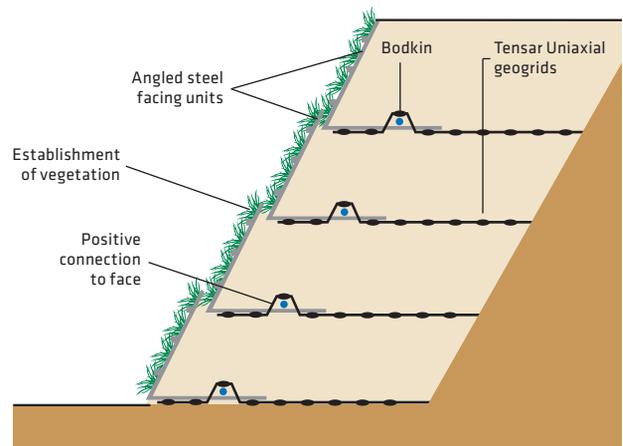
Tensar Design Service

Tensar's experienced civil engineers are able to help take your project onto the next stage. Our Design service is on-hand to provide standard Application Suggestions to establish viability of Tensar's products and systems and enable planning costs, right through to preparing certified detailed design and construction drawings for using Tensar products

and systems on your project. Upon request, we can provide all necessary design certification and working calculations in a form ready for checking, with drawings issued for construction as well as all the crucial specification and installation details.



Tensar software enables safe, economic design solutions.



The face may be stepped to allow infiltration of rainwater.

TensarSoil™ Design Software

For more than 30 years Tensar has developed some of the most sophisticated reinforced soil design software in the world. This is used to provide clients with economically

efficient, accurate and timely Application Suggestions, allowing our Design Engineers to assist in scheme design from feasibility right through to construction.



Tensar can provide a variety of solutions for vegetated slopes of up to 70°.



TensarTech GreenSlope offers flexibility of design and finish.

Your local distributor is:

Tensar®

Tensar International Limited
Units 2-4 Cunningham Court
Shadsworth Business Park
Blackburn BB1 2QX
United Kingdom

Tel: +44 (0)1254 262431
Fax: +44 (0)1254 266867
e-mail: info@tensar.co.uk
tensar-international.com



Q 05288
ISO 9001:2008



EMS 86463
ISO 14001:2004

Copyright ©Tensar International Limited 2013
Printed September 2013, Issue 5, 485/09-2013

The copyright in this brochure (including without limitation all text, photographs and diagrams) and all other intellectual property rights and proprietary rights herein belongs to Tensar International Limited and/or its associated group companies and all rights are reserved. This brochure, whether in whole or in part, may not be copied or redistributed or reproduced or incorporated in any other work or publication in any form whatsoever without the permission of Tensar International Limited. The information in this brochure supersedes any and all prior information for the products referred to in previous versions of this brochure, is of an illustrative nature and supplied by Tensar International Limited free of charge for general information purposes only. This brochure is not intended to constitute, or be a substitute for obtaining, project specific engineering, design, construction and/or other professional advice given by someone with full knowledge of a particular project. It is your sole responsibility and you must assume all risk and liability for the final determination as to the suitability of any Tensar International Limited product and/or design for the use and in the manner contemplated by you in connection with a particular project. The contents of this brochure do not form part of any contract or intended contract with you. Any contract for the provision of a Tensar International Limited product and/or design service will be on Tensar International Limited's Standard Conditions in force at the time of entering into the contract. Whilst every effort is made to ensure the accuracy of the information contained in this brochure at the time of printing, Tensar International Limited makes no representations about the suitability, reliability, comprehensiveness and accuracy of the information, services and other content of this brochure. Save in respect of Tensar International Limited's liability for death or personal injury arising out of negligence or for fraudulent misrepresentation (if any), Tensar International Limited shall not be liable to you directly or indirectly in contract, tort (including negligence), equity or otherwise for any loss or damage whatsoever or howsoever arising in connection with the use of and/or any reliance placed upon the contents of this brochure including any direct, indirect, special, incidental or consequential loss or damage (including but not limited to loss of profits, interest, business revenue, anticipated savings, business or goodwill). Tensar, TensarTech, TriAx and Spectra are registered trademarks. In case of legal disputes between the parties, the original English version of this disclaimer shall prevail.

Contact Tensar or your local distributor to receive further literature covering Tensar products and applications.

Also available on request are product specifications, installation guides and specification notes.

The complete range of Tensar literature consists of:

- ▶ **Tensar® Geosynthetics in Civil Engineering**
A guide to products, systems and services
- ▶ **Subgrade Stabilisation**
Stabilising unbound layers in roads and trafficked areas with a Tensar MSL
- ▶ **Spectra® Pavement Optimisation System**
Improving the structural performance of whole pavements with a Tensar MSL
- ▶ **Asphalt Pavements**
Reinforcing asphalt layers in roads and trafficked areas
- ▶ **TensarTech® Earth Retaining Systems**
Bridge abutments, retaining walls and steep slopes
- ▶ **Railways**
Mechanical stabilisation of track and sub-ballast
- ▶ **TensarTech® Plateau™**
Load transfer platform system over piled foundations
- ▶ **Basal Reinforcement**
Basetex high-strength geotextiles
- ▶ **TensarTech® Stratum™**
Cellular foundation mattress system for foundations with controlled settlement
- ▶ **Tensar® Erosion Control**
A guide to products and systems