

Installation Guideline for TensarTech® NaturalGreen™ Reinforced Embankment System



Introduction

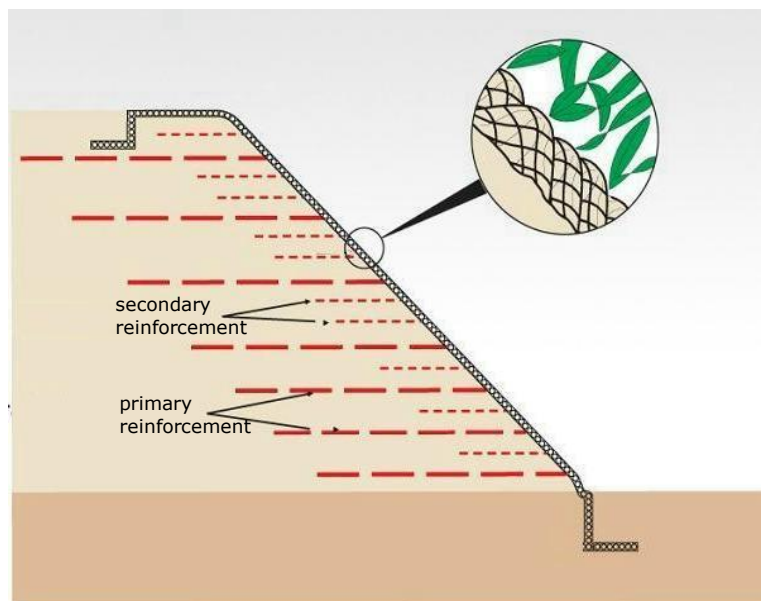
This Installation Guideline provides a step-by-step guide intended for use by contractors planning to construct a reinforced soil slope using TensarTech® NaturalGreen™ system.

TensarTech NaturalGreen System has been developed to provide engineers, architects and builders with an attractive and economical solution for the construction of embankments with a face slope angle up to 45° to the horizontal.

TensarTech NaturalGreen is one of a range of earth retaining systems available from Tensar International Limited, comprising proprietary Tensar uniaxial geogrid as primary reinforcement, TriAx® geogrid as secondary reinforcement and a rolled erosion control product secured with Tensar pegs.

Where applicable, the Contractor shall ensure that the installation fully complies with CDM Regulations 2015 and should refer to the Designer's Risk Assessment and COSHH statements.

The Tensar uniaxial geogrid for primary reinforcement are available in different strength grades identified by coloured banding. All supplied in 1.3m wide rolls either 50m or 75m long. TriAx geogrid for secondary reinforcement is supplied in 4m wide rolls 75m long. Both materials are supplied unwrapped and bound using coloured identifying tape. Both materials are UV protected and may be stored outside until use.



Typical section - TensarTech® NaturalGreen™ Slope

Rolled erosion control product can be supplied by Tensar depending on the project. A suitable erosion product is P300, supplied in rolls 35.0m long by 2.4m wide and comprising 100% UV stable polypropylene fibres incorporated between two layers of UV stable polypropylene netting. Erosion control materials are normally wrapped in polythene but should be stored in a cool dry place avoiding exposure to naked flame or spark, as they may be readily flammable, particularly bio-degradable erosion products comprising natural materials. They are vulnerable until installed and have had the opportunity to absorb moisture.

Tensar pegs to secure the rolled erosion control product are supplied in bags of 25 and may be stored outside if necessary.

Installation

1. The Contractor shall excavate to the lines and grades shown on the construction drawings and should take precautions to minimize over-excavation. Over-excavation should be filled with compacted approved infill material, or as directed by the Engineer.

2. Following the excavation, the foundation soil should be examined by the Engineer to assure actual foundation soil strength meets or exceeds the design bearing strength. Soils not meeting the required strength should be removed and replaced with infill soils, as directed.



3. Foundation soil shall be proof rolled and compacted then inspected by the Engineer prior to commencement of construction of the reinforced soil slopes.

4. Cut and position the base layer of Tensar uniaxial geogrid primary reinforcement at the formation level shown on the contract drawings. The uniaxial geogrid grades are identified by the letters RE and a number which will correspond with the geogrid layout shown on the construction drawing(s). The principle strength direction of the uniaxial geogrid is along the roll length and as such primary geogrid should be laid perpendicular to the slope face alignment.

5. Each geogrid reinforcement length shall be positioned to intercept the line of the final slope face at that elevation (after slope trim). Adjacent lengths of geogrid are butt jointed side-to-side at the slope face.

6. All geogrid should be installed to the levels, lengths and orientations as shown on the construction drawings.

7. Selected suitable fill material should be in full compliance with the needs of the design and have the approval of the engineer.

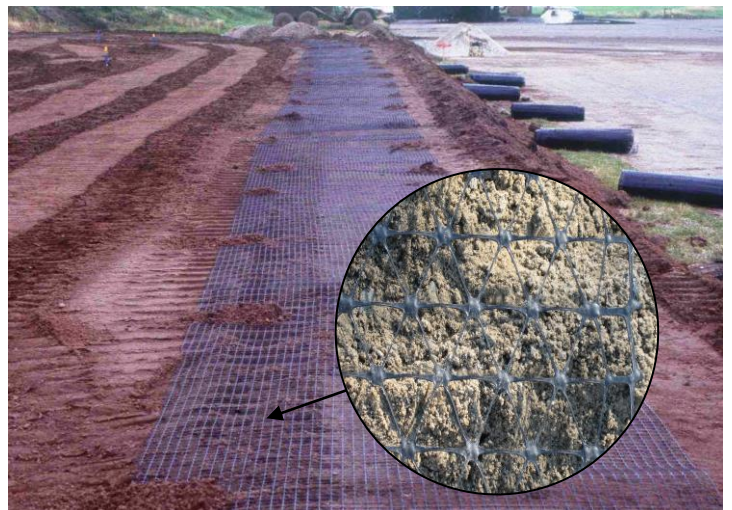
8. Place and compact the fill in layers as specified in the Contract Documents, incorporating primary reinforcement and secondary reinforcement as shown on the construction drawings.



9. The TriAx geogrid secondary reinforcement must be laid in the correct direction rolled out parallel to the slope face. The 4m wide rolls may be cut whilst still on the roll to widths corresponding with the construction drawing; normally 2m, but this must be checked.

10. Fill should be placed by plant such as an excavator with an opening bucket, which causes the fill to cascade onto the geogrid. A 150mm thick cover of fill must be maintained between the tracks of any plant and the geogrid to avoid damage to the geogrid.

- 11. The embankment may be overfilled, compacted and then trimmed to the final face slope profile in the conventional manner.
- 12. Use of a toothless excavator bucket is recommended for face trimming to prevent snagging on the edge of the buried geogrid. Although care should be taken not to over cut, the machine performing the face trim will not cause structural damage whilst performing this task.
- 13. On completion of the filling operation the slope surface should be covered with a minimum 100mm layer of suitable topsoil in accordance with BS3882, or as specified in the Contract Documents. Over-compaction of the topsoil should be avoided.



TriAx geogrid secondary reinforcement cut from the roll 2m wide and rolled-out parallel to the slope face.

- 14. Where a grass cover is specified, scatter the chosen seed mix on to the slope at the specified rate per square metre.
- 15. The rolled erosion control product should then be installed.

- 16. The rolled erosion control product is rolled down the slope face lapping adjacent rolls by a minimum of 100mm. Tensar pegs should be used to fix the rolled erosion control product at 1.0m centres along the laps by driving them into the soil using an appropriate rubber hammer. Rolled erosion control product must follow the slope profile and remain in contact with the underlying topsoil layer. Additional pinning and/or pinning of the centre of roll may be required.



- 17. Roll ends shall be buried at the shoulder and toe respectively in shallow trenches approximately 450mm wide by 250mm deep.
- 18. If specified, the slope may be planted with a suitable ground cover plant species as per the Contract Documents. The rolled erosion control product should be slit to allow the chosen plants pushed through the product into the topsoil below.

- 19. Care should be taken at this stage when using biodegradable rolled erosion control products to avoid exposure to naked flame or spark, as the product may be flammable until it has had the opportunity to absorb moisture.
- 20. The Contractor must fully assess the safety risk associated with working on the slope and at height and where appropriate install any necessary temporary edge protection and provide operatives with the appropriate safety equipment.

Notes

The contractor is responsible for checking slope geometry during construction and taking necessary action to ensure that tolerance are met in accordance with Tensar recommendations.

For cellular confinement erosion control products this construction sequence should be read in conjunction with IG_NaturalGreen_Cellular.

Please refer to Tensar International Limited if more specific advice is required.

This document was formerly published with the reference:CS/NaturalGreen

The information in this document supersedes any and all prior Construction Sequences for the products/system designated above and is supplied by Tensar International Limited without charge. Tensar International Limited excludes to the fullest extent lawfully permitted any and all liability whatsoever for any loss or damage howsoever arising out of the use of and reliance upon this information. 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.

Tensar, TensarTech and TriAx are registered trademarks

Copyright © Tensar International Limited 2020

Tensar International Limited

Tel: +44 (0) 1254 262431

Fax: +44 (0) 1254 266867

E-mail: sales@tensar.co.uk

UK Head Office

Units 2 – 4 Cunningham Court

Shadsworth Business Park

Blackburn

BB1 2QX



Cert – QM505288
Applicable to Tensar International
and Tensar Manufacturing Ltd



Cert – EMS86463
Applicable to Tensar Manufacturing Ltd