

# TensarTech GreenSlope Earth Retaining Systems



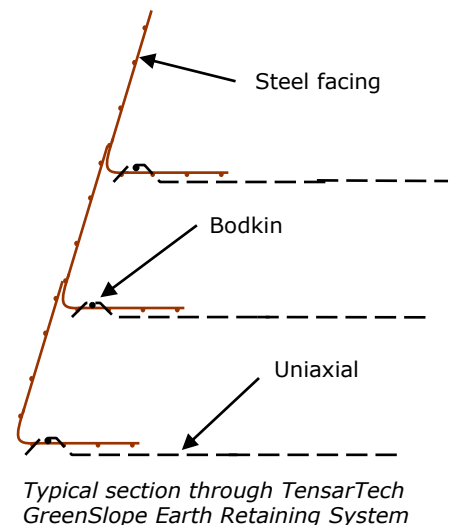
## Introduction

TensarTech GreenSlope System has been developed to provide Engineers, Architects and Builders with an attractive and economical earth retaining solution. The system, comprising proprietary steel facing units and Tensar uniaxial geogrid reinforcement is one of a range of earth retaining systems available from Tensar International in the UK

## Construction Sequence

Where applicable, the Contractor shall ensure that the installation fully complies with CDM Regulations 2007 and should refer to the Designer's Risk Assessment and COSHH statements.

1. The Steel Facing Units are delivered to site bundled together and tied using steel tying wire, together with brace bars (3 per unit) and anchor pins. They may be stored outside.
2. The primary geogrid reinforcement is delivered in either 75m or 50m long x 1.3m wide rolls and may be stored outside
3. HDPE bodkins are delivered in cardboard boxes of 40No. These may be stored outside but may benefit from being stored undercover to prevent water damage to the cardboard box.



*Steel facing units and uniaxial geogrids located in position*

4. Prepare the formation to line and level in accordance with the contract documents.
5. Cut the lengths of the required grade of geogrid from the roll as indicated by the design drawings. Place on to the formation with the leading edge at the front edge of the structure. Ensure that the geogrid is orientated in the correct direction.
6. Position the facing units along the line of the structure, overlapping longitudinally by 100mm. Connect adjacent units using steel tying wire to locate.
7. The system must be constructed in accordance with the contract drawings using the required number of grid layers.

8. Lay the geogrid flat and pulling it by hand to ensure that no slack is left in the bodkin connection. Drive in to the ground two anchor pins behind the longitudinal bars on the base of the facing unit.. This will ensure no movement of the steel facing unit when the geogrid is lightly tensioned using the beam supplied. Adjacent lengths of geogrid need only be butt-jointed, there is no necessity for overlap



*Face liner is rolled out and fixed to the inside of the facing units*

9. Using the polymer bodkin, connect the uniaxial geogrid reinforcement to the horizontal base of the steel facing unit, at the first aperture away from the face. The geogrid should be lightly tensioned using the tensioning beam supplied so that all slack is removed from the bodkin joint. Whilst maintaining tension, place a layer of fill on the grid which is sufficient to restrain it in position when the load is released or alternatively retain the tension by driving 2 steel pins through the last row of apertures at the rear end of the geogrid.

10. Cut and place the biodegradable mat or geotextile/net supplied inside the face, locating it temporarily with cable ties or tying wire if necessary. The face liner should lap back horizontally in to the structure by a minimum of 100mm. Care should be taken at this stage if using the biodegradable mat to avoid exposing it to naked flame or spark, as it may be readily flammable until it has had the opportunity to absorb moisture. It is recommended that positive measures are taken to ensure the establishment of vegetation within 4 months of installation if the biodegradable mat liner option is chosen.

11. Fix the brace bars in to position at a rate of 3 per facing unit. They should hook around a steel bar junction in the uppermost horizontal bar of the face and a junction point at the rear-most horizontal bar of the base.

12. Where a vegetated face is specified, place horticultural topsoil in accordance with BS3882, behind the face lining at lift heights compatible with the structural fill compaction. This is continued up to the level of the next layer of reinforcement in tandem with the structural fill material, to a typical width in cross section not exceeding 150mm.

\* If the Landscape Architects require a greater topsoil thickness than 150mm then they should consult Tensar International Ltd in advance who can then advise on an appropriate construction approach and facing detail.



*Steel brace bars fixed in to position to maintain the 70° face angle for the long-term*

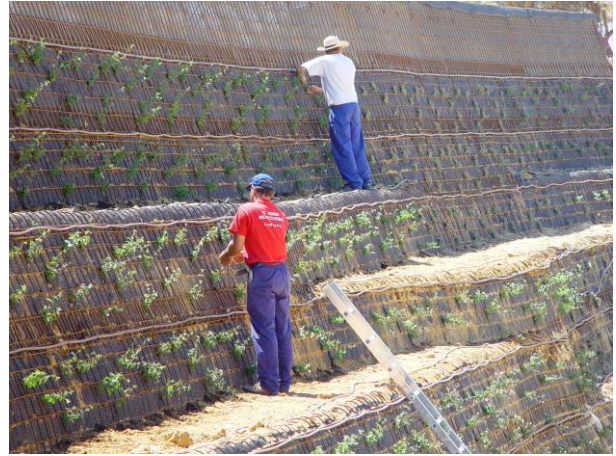
13. The topsoil should be consolidated by hand tamping or 'heeling-in' so as to avoid over compaction.

14. Selected suitable fill material should be in full compliance with the needs of the design and have the approval of the engineer. Place and compact the fill in accordance with Contract specification, up to the level of the next geogrid layer. Fill should be placed by plant such as an excavator bucket or a dozer with an opening bucket, which causes the fill to cascade onto the grids. A minimum of 150mm thick cover of fill must be maintained between the tracks of any plant and the geogrid to avoid damage. Care should be taken during this operation to maintain the alignment of the facing units.



*GreenSlope facing units installed and ready for commencement of filling process*

15. Care should be taken to avoid compaction of the topsoil layer and contact with the facing units by any of the compaction plant and the following restrictions should apply:
16. All construction plant, including compaction equipment with a mass exceeding 1000kg should be kept at least 2m from the face of the wall. Compaction plant within 2m of the wall should be restricted to vibrating rollers having a mass per metre width not exceeding 1300kg or plate compactors with a mass less than 1000kg
17. Compaction should always commence nearest the facing units, working away towards the free end of the grid.
18. If secondary reinforcement is specified, this should be cut from the roll and laid in to the face area as required. The geogrid should be butted-up to the face of the steel facing unit but no connection is necessary.
19. Placement of the topsoil layer and fill material should be continued as described in steps 12 – 18 up to the level of the next layer of primary reinforcement. At this point the next course of steel facing units may be installed to stretcher bond and construction of the reinforced slope continues to the required height.
20. Upon completion further grass seed may be scattered on to the finished face of the structure.
21. Where there is step back or terrace to the next facing unit, it is recommended that the protruding vertical bars are bent down to the horizontal. This is to prevent the possibility snagging when operatives are climbing on or abseiling down the face for planting or maintenance purposes. A short piece of scaffold tube may be improvised to bend the bars in question.
22. The Contractor must fully assess the safety risk associated with working at height and where appropriate install any necessary temporary edge protection.
23. As well as following procedures for health and safety, it is essential when handling wire products that suitable protective glasses and gloves are worn.



*As an alternative to grass or as an accompanying ground cover, the face of the structure may be planted through when construction is complete.*

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