

Installation Guideline for TensarTech[®] TR2 Earth Retaining System

This Installation Guideline provides a step-by-step guide intended for use by Contractors planning to construct a reinforced soil retaining wall using TensarTech[®] TR2 System.

Introduction

The TensarTech TR2 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. The steel mesh facing is intended for use as a temporary face where aesthetics are of secondary importance or where a particular permanent feature face such as masonry or special concrete panels are to be attached or a concrete face may be cast in-situ. TensarTech TR2 may also be used as a hidden thrust relief structure behind an existing wall.

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.



Figure 1 TensarTech TR2 temporary bridge abutment

Installation

The TensarTech TR2 steel mesh facing panels are delivered on flat bed vehicles for site off-load together with the L bar temporary supports and the steel anchor bars. The nominal weight of a sheet of the steel fabric mesh 2.4mx 4.8m is 94 Kgs and the number of sheets per Tonne is 11 No. The Contractor must fully assess the safety risk associated with handling the steel components during off-loading and installation and make suitable safe provision for doing so.

1. The steel components may be galvanised although this is not usually necessary and is dependent on the requirements of the design.
2. Steel components may be stored outside without fear of damage from the weather
3. Tensar uniaxial geogrid is delivered in either 75m or 50m long x 1.3m wide rolls and may be stored outside without fear of damage from the weather.
4. Tensar polymer bodkins are delivered in cardboard boxes of 40. These may be stored outside but may benefit from being stored undercover to prevent water damage to the cardboard box.
5. The structure must be constructed in accordance with the contract drawings using the required number of Tensar geogrid layers, of the correct grade, at the specified vertical spacing and length.
6. The steel mesh face panels consists of 10mm bars at 100mm spacing and 8mm bars at 200mm spacing. The mesh should be cut into 2.4m x 2.4m square panels
7. Prepare a level formation as required by the contract documents.

8. Position the steel mesh face in accordance with the drawing, with the 10mm bars vertical. Use the "L" shaped bars at 1.2m horizontal spacing to keep the first lift of mesh at the correct angle by tying to the steel mesh face with a suitable tying wire. See Figure 2. It may also be necessary to prop externally or tie back the face temporarily to maintain alignment

9. Protect the exposed top of the vertical mesh bars with the plastic caps provided. Repeat this throughout construction.

10. The face liner geotextile, which is normally a non-woven needle-punched fabric, should be placed and fixed inside the steel mesh face as construction progresses. This face liner needs to be folded back horizontally a minimum 100mm top and bottom between the layers of Tensar geogrid to prevent loss of fines from the fill material.

11. Place and compact approved fill in accordance with the contract specification up to the level of the lowest Tensar 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 Tensar geogrid. A minimum of 150mm thick cover of fill must be maintained between the tracks of any plant and the Tensar geogrid to avoid damage.

12. Compact the fill in layers. Only nominal compaction is required for the 150mm directly behind the face but elsewhere compaction should be in accordance with the latest version of UK Manual of Contract Documents for Highway Works (MCHW), Volume 1, Series 600 for Earthworks, or as specified in the contract documents. With the important restriction within 2m of the face panel to use only a vibrating plate compactor or vibrating roller with a mass per metre width less than 1300kg and a total mass less than 1000kg.

13. Return the geotextile over the fill with a minimum of 100mm horizontal lap.

14. Cut and position the first layer of geogrid (with full allowance for the fold back length to form the bodkin connection) and connect to the face (see Figures 3 and 4) using the horizontal steel anchor bar and the Tensar polymer bodkin. Adjacent lengths of geogrid are butt jointed side by side at the face.

12. It is important that if the centre of any anchor bar is less than 50mm above the centre of any horizontal bar of the steel mesh face, then the level of that geogrid and it's anchor bar shall be lowered so that it is located .



Figure 2 – L bars and face units in place

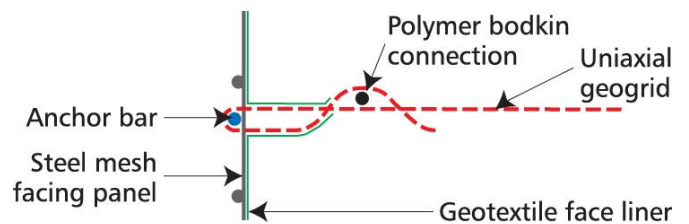


Figure 3 Bodkin and anchor bar connection detail

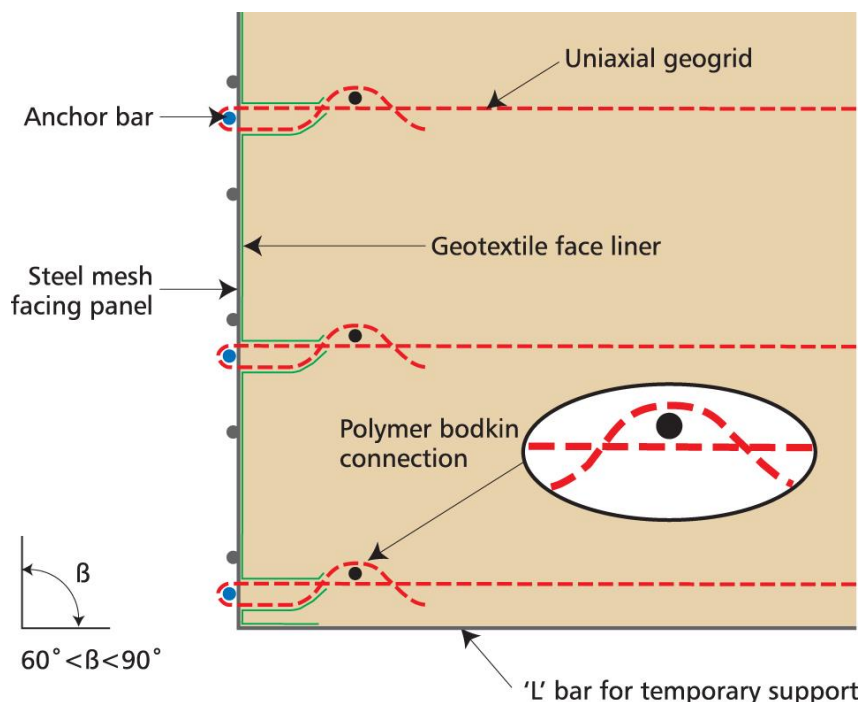


Figure 5

13. To tighten the bodkin joint, insert the tensioning beam^[1] through the apertures at the free end of the Tensar geogrid and apply a load sufficient to remove any slack in the bodkin joint (Figure 5). Leverage on a steel bar dug into the fill through the loop on the beam is usually sufficient.
14. Whilst maintaining tension, place a layer of fill on the Tensar geogrid, which will be sufficient to restrain it when the load is removed (Figure 5). Release the tension and remove the beam.
15. Position the next geotextile liner with a minimum horizontal lap of 100mm.
16. Place and compact fill in layers up to the next layer of Tensar geogrid.
17. Repeat steps 11-16 up to the design height of the structure extending steel mesh as necessary by tying in additional panels with a vertical lap of 400mm and a horizontal lap of 90mm.
18. The Contractor must fully assess the safety risk associated with working at height and where appropriate install any necessary temporary edge protection.
19. As well as following procedures for health and safety, it is essential when handling wire products that protective glasses and gloves are worn.



Figure 5 – Tension the geogrid and placing the fill

Note;

[1] Tensar Technical Note TN/Uniaxial_Beam

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