

Installation Guideline for TensarTech® TW3™ Wall System



This Installation Guideline provides a step-by-step guide intended for use by Contractors planning to construct an earth retaining structure using the TensarTech® TW3™ wall system.

The TensarTech TW3 wall system has been developed to provide engineers, architects and builders with an attractive and economical retaining wall package. The system, comprising mortarless concrete block facing and Tensar uniaxial geogrid reinforcement is one of a range of retaining wall options available from Tensar International.

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.

Installation

STEP 1 Preparation

1. Excavate for the formation and levelling strip according to the design and layout of the wall. The TensarTech TW3 wall system has a nominal face angle of 89.6° (1:128) which should be taken into consideration when setting the wall out.
2. Cast a concrete levelling pad with typical dimensions of 600mm wide x 150mm high or as specified in the Contract Documents.
3. Blocks are delivered to site on pallets with 24 number blocks per pallet, the nominal weight of each pallet is 950Kgs
4. The top of the levelling pad would normally be set a minimum of 450mm below finished ground level or to the level indicated on the contract drawings.

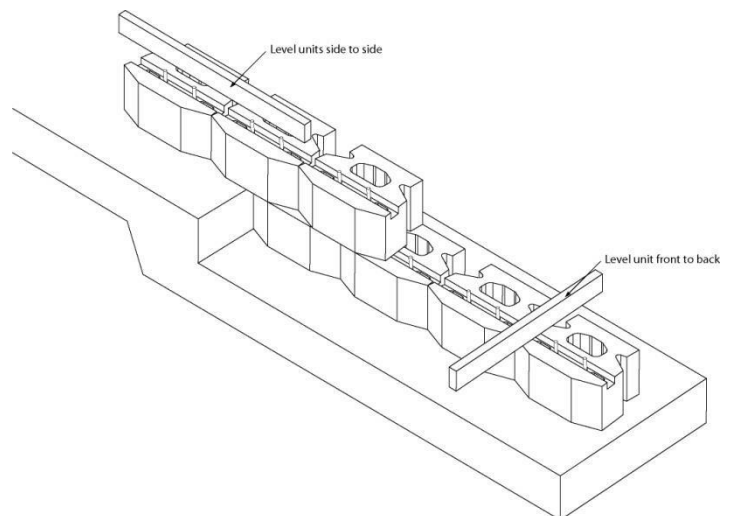


Figure 1 First course of blocks laid on levelling pad

STEP 2 – Installation of the base layer course

5. Bed the first course of TW3 blocks side by side on the levelling pad setting pinholes in adjoining blocks 305mm centre to centre, on a cement:sand mortar (1:3 ratio) ensuring that the top of the block is uppermost. The top of the block has a continuous grooved recess and two pin holes. A lifting tool is available from Tensar to assist in the placing and handling of the blocks. Correct alignment and level of the first course is critical for accurate and acceptable construction.
6. Ensure that the blocks are level front to back, side to side and to the correct alignment (Figure 1). Align the blocks with a string line placed on the back of the block, or for curved walls to the appropriate radius, but using the back of the block as the datum. Allow the mortar bed to cure before laying additional courses.

STEP 3 – Inserting the interlocking pins

7. Place a pair of Tensar TW3 fibreglass pins into the pinholes (Figure 1). The TW3 facing block is designed for use with the Tensar TW3 polymeric connector and has only two holes set to form a finished wall face at a nominal face angle of 89.6° (1:128)

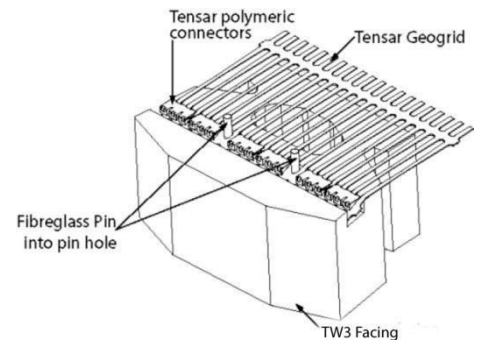


Figure 2 Pins and Tensar connector in place

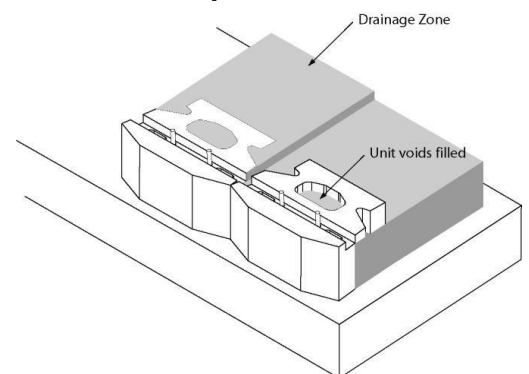


Figure 3 Drainage material placed behind blocks

STEP 4 – Installation of drainage layer and rock fill

8. Fill all voids within, between and 300mm immediately behind the TW3 blocks with an approved angular drainage medium hand tamped to avoid settlement. This granular fill material to fill all voids must be a crushed coarse aggregate 4/20mm in accordance with BS EN 12620 : 2002+A1: 2008, or as specified in the contract documents. Pea gravel or other rounded aggregates must not be used. The drainage zone should extend 300mm behind the TW3 blocks in accordance with BS8006-1: 2010+A1: 2016 and terminate approximately 500mm from the top of the wall.
9. Place and compact approved fill behind the drainage zone in accordance with the latest version of Manual of Contract Documents for Highway works (MCHW), Volume 1 specifications for Highway Works (MCHW1) Series 600 for Earthworks, or as specified in the Contract Documents, up to the top of the course.
10. All construction plant, including compaction equipment with a mass exceeding 1000kg should be kept at least 2m from the face of the wall.
11. Compaction plant used 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
12. Compaction should always commence nearest the facing blocks, working away towards the free end of the Tensar geogrid.

STEP 5 – Installation of Tensar geogrid and additional courses

13. Ensure that the compacted fill is generally level with the facing blocks to receive the geogrid.
14. Sweep the blocks clean to remove all loose debris. On occasions there could be small pockets of dry mix concrete 'splatter' on the top of the blocks and in the recess. A wire brush can be used to remove these to ensure the connection assembly and blocks sit neatly.
15. The specified grade of Tensar geogrid is to be incorporated at the locations specified and shown on the Contract Drawings. Cut the Tensar geogrid from the roll to the required design length as indicated on the Construction drawings.



Figure 4 Tensar connector engages with Tensar geogrid and inserts into rebate in TW3 blocks

16. At the end to be connected to the blocks ensure that the row of ribs is trimmed back close to the transverse bar of the geogrid. Alternatively, to avoid the need for shimming it is acceptable to trim the ribs so that they project uniformly 50mm in front of the transverse bar.
17. Place the prepared end of the geogrid over the rebate in the block and locate the blue moulded connectors around the transverse bar, making sure the second transverse bar is clear at the rear of the block. Ensure that a connector covers each aperture of the geogrid. The connectors may be split where necessary and trimmed to fit around the pin in the recess. Note that when constructing with the thicker Tensar uniaxial geogrid grades it may be necessary to cut the transverse bar locally around the fibreglass pins for it to sit neatly in the recess.
18. Position the assembly neatly into the rebate and push down firmly. The next course of blocks is placed over the fibreglass pins, locating the kidney-shaped recesses over the pins taking care not to disturb the Tensar geogrid and connector in the block below. Repeat this procedure for the whole course ensuring that adjacent lengths of Tensar geogrid are abutted side-by-side at the wall face
19. The facing block is centred over the underlying block and is then pushed towards the front of the structure until it makes full contact with both pins.
20. During construction it will be necessary to regularly check and correct both horizontal and vertical alignment. The line and level of the wall overall should be checked every 3rd course. Any adjustment necessary may be made using ribs cut from the geogrid to act as shims, placed in between blocks, or where necessary, by use of mechanical grinding.
21. The Tensar geogrid should be lightly tensioned using the tensioning beam supplied (Figure 5), so that the moulded geogrid connectors are pulled up against the rear of the rebate.
22. Either pin, or place fill onto the Tensar geogrid before the tensioning beam is removed.
23. The backfill is placed by mechanical plant, with an opening bucket, such that it causes the fill to cascade over the Tensar geogrid to cover the geogrid in a uniform manner.
24. A 150mm thick cover of fill must be maintained between the Tensar geogrid and the tracks of any plant to avoid damage. Repeat steps 13 and 24 to construct the wall to the required height
25. The top facing block should be bonded to the underlying facing block using four spots of approved external construction adhesive.

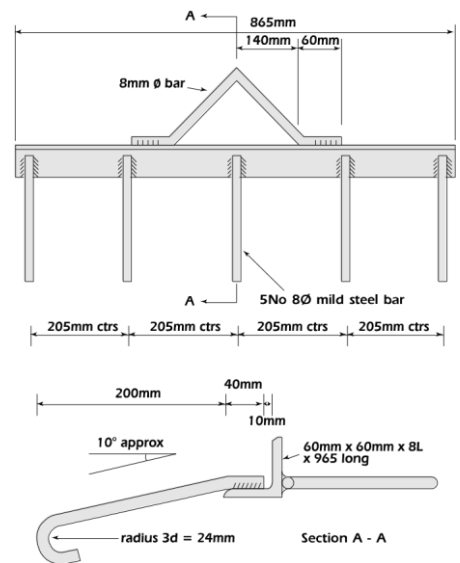


Figure 5 Tensioning Beam

STEP 6 – Installation of proprietary corners and TW3 Caps

26. Propriety corner blocks are available for 90° corners (and other angles if required). The corner is textured on two faces which can be reversed to provide left and right-handed blocks. The corners blocks are bonded together on site using two beads of the adhesive supplied by the block producer. These corner blocks can also be used to form the vertical stop end face at the top of stepped walls.

27. Complete the wall using the TW3 caps supplied. The capping units have an edge with a split or textured face to suit TW3 facing units with a split face. The opposite face or edge is smooth and may be used when capping a TW3 smooth face wall. The installer should choose which edge to present to the front of the wall to match the face finish below. Sweep the top of the wall face clean to remove debris. If using the split face then place the TW3 cap over the pins in the underlying blocks on either four spots of adhesive (supplied with the caps) or on a cement and sand mortar (1:3 ratio), then push forward onto the pin. If choosing to present the smooth edge then do not use the pins in the top course of facing units and simply place the coping units on four spots of adhesive (supplied with the caps) or on a cement and sand mortar (1:3 ratio). Make minor adjustments to the alignment as necessary.

Notes

1. The Contractor must fully assess the safety risk associated with working at height and where appropriate install the necessary temporary edge protection.
2. The Contractor is responsible for checking wall geometry during construction and taking all necessary actions to ensure that wall tolerance is met in accordance with Tensar recommendations.

Please refer to Tensar International if more specific advice is required

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