

Forming joints with TERRAM geotextiles

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Introduction

Joining TERRAM geotextiles can be achieved by overlapping, sewing, stapling or bonding.

Overlapping adjacent or subsequent rolls is the most-frequently-used method. However, there are situations when a more-substantial seam is required on the grounds of economy (reducing overlap waste), providing a degree of tensile strength continuity, or where the textile could move if a simple overlap was used. Sewing is generally the most satisfactory method in these cases.

Overlapping

For sub-base/subgrade separation, the overlap width can vary between 300mm and 1000mm depending upon subgrade strength, profile, and the stress anticipated at the overlap. 300mm is generally adequate for a firm, level subgrade but 1000mm may be necessary on a soft, uneven subgrade (see Fig 1).



Fig 1

Overlaps should be formed so that sub-base is spread over, not against, the leading edge of the top textile. Care must be taken to avoid undue stress of the overlap if displacement is to be avoided.

If high-strength grades are to be placed as filters beneath large rock e.g. coastal and river defences, then the overlap should have a minimum width equal to the diameter of the rock.

Sewn joints

Sewn joints can be formed with edges face to face - *prayer* seam (Fig 2) or with a lapped J seam (Fig 3), each with either a single or double stitch line depending upon the strength required. Polyester or aramid sewing thread can be used.



Fig 2

The single-seam prayer joint is satisfactory for most Terram geotextile grades since it produces a strength equivalent to about 75% of the textile's strength.

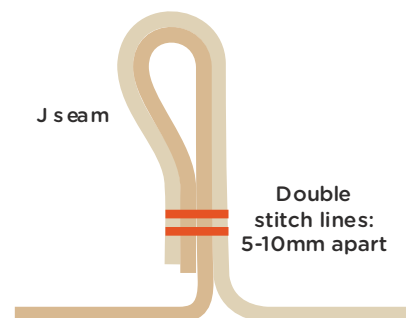


Fig 3

Stitch lines should be parallel to the edge, with the outer line at the selvedge inside edge and the stitch frequency per inch of the outer line maximised for optimum results.

It is advisable to use the sewn joints where sand is the trafficked surface above the textile otherwise it is possible for the sand to migrate through a simple overlap. Ensure that the seam *stand up* faces down.

Portable hand-operated battery-powered stitching machines are generally used with Metric 9 polyester thread, providing a double-thread-feed chain, single stitch generally set to provide 16 stitches per 100mm. Metric 25 polyester thread can be used with lightweight textiles e.g. Terram 1500 and below.

Aramid thread (around 420 tex) is used to form high-strength sewn joints. These should ideally be sample and tested for performance. It is also worth noting that factory-produced seams, using more robust sewing equipment and under more ideal processing conditions, are likely to produce more superior results than on-site sewing.

Portable, electrically-powered, sewing machines (mains/battery) are obtainable from:

J & B Sewing Machine Co Ltd. Curlew Close,
Queensway Meadows, Newport NP19 4SY
Tel:- +44 (0)1633 281555 Fax:- +44 (0)1633 281666
www.jbsewing.com

The sewing operation requires a short training period (2 hours) to master the technique and familiarise with the machine and a period of practice (1 day) to perfect the method. One operator plus two labourers are normally required.

Once set up the sewing machine operation can provide acceptable installation rates. However, construction site conditions can cause problems: a broken thread can lead to unthreading problems, dampness can cause the thread or needle to break, bobbins need to be covered to keep the yarn clean and dry (a plastic bag will suffice). It is essential to keep machines in good order and close liaison with the sewing machine manufacturer's representative is recommended.

Stapled joints

Terram geotextiles can be joined by stapling, preferably using a lapped seam and an industrial stapling device. Seam strengths are likely to be much lower than those achievable by sewing.

A suitable stapler is obtainable from Rosenheim, Lancaster Fields Gateway, Crewe CW1 6FF
Tel: 01270 585959

Bonded joints

Joints can be bonded using adhesives, but this is not generally recommended for site-formed joints as the textile needs to be clean and dry, and joints formed on a firm base. However, a good seam strength can be achieved using a hot-melt adhesive to form a simple 100mm wide overlap under controlled conditions.

The hot-melt adhesive should be applied in accordance with the manufacturer's instructions. Pressure must be applied to the joint in order to force the glue into the textile. Pressure may be applied by standing on the joint.

Hot-melt adhesives and applicator guns are obtainable from The Adhesive Company (AHS), Unit 2a, Hargreaves Road, Groundwell Industrial Estate, Swindon, SN25 5AZ Tel: 01793 421905

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