

Jointing Methods

Introduction

Where Terram widths or lengths greater than those supplied on one roll are required, jointing may be effected by overlapping, sewing, stapling or gluing.

In the vast majority of cases, the fabric width or length is extended simply by overlapping which is usually found to be the easiest method.

However, there are occasions when seaming is deemed necessary on grounds of economy (reducing overlap waste), or to provide a degree of tensile strength-continuity across the joint, or where material could move between lapped joints. For these purposes, sewing is generally the most satisfactory method.

Overlapping

For subbase/subgrade separation the extent of overlap varies between 0.3m and 1.0m depending upon subgrade bearing capacity and profile etc., and the anticipated stress at the joint. On firm level subgrades 0.3m is generally adequate but on soft, uneven ground 1.0m may be necessary (*see Fig 1*). Stability, and a reduction in the extent of overlap, can be achieved by pinning the fabric to the ground. On areas of peat where excessive settlement is expected, or on underwater sea bed installations, half roll-width overlaps (double layer) have occasionally been used.

To prevent the overlapped fabrics from becoming separated as aggregate is pushed forward, the 'continuation' roll must be tucked under the material already in place. Care must be taken too, to avoid undue stress at the overlap, if fabric displacement is to be avoided.

Where large rocks are to be placed (e.g. on coastal defence works) on tougher high strength or composite fabrics, overlaps at least the diameter of the rocks will be required.

Where sand is the trafficked surface above Terram which has to be jointed (e.g. bridle paths), it is advisable to use the sewing technique, as with a simple overlap, it is possible for sand to creep between the surface. In this case, however, the seam "stand up" should always face down.

For reinforcement applications, where reinforcement load transference is required across the joint, please seek additional guidance from Terram.

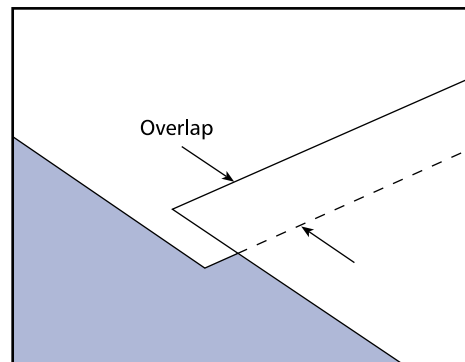


Fig 1 Simple Overlap

Terram Ltd
Mamhilad, Pontypool
Gwent NP4 0YR, United Kingdom
Tel: +44 (0) 1495 757 722
Fax: +44 (0) 1495 762 393
Email: info@terram.co.uk
Web: www.terram.com

Joining Methods

Sewing

Terram can be joined by sewing using a polyester or aramid sewing thread, either face to face "prayer" seam (*Fig 3*) or with a lapped "J" seam (*Fig 5*) each with either a single or double stitch line depending upon strength requirements.

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. On lightweight membranes (e.g. Terram 1500 and below) Metric 25 polyester thread can be used.

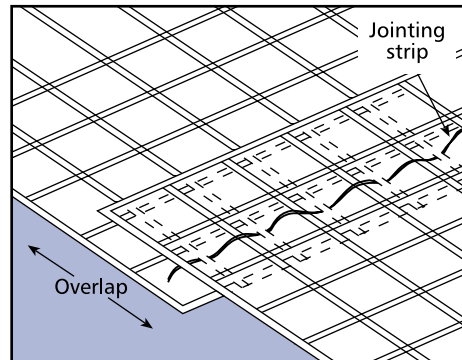


Fig 2 Grid Overlap

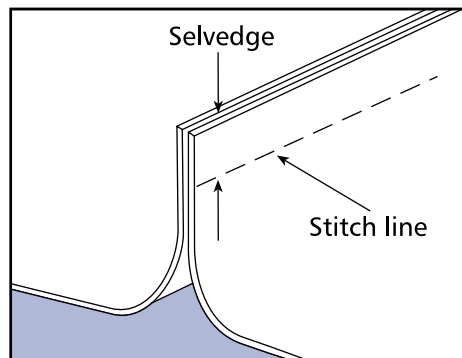


Fig 3 Face to Face ("Prayer") Seam

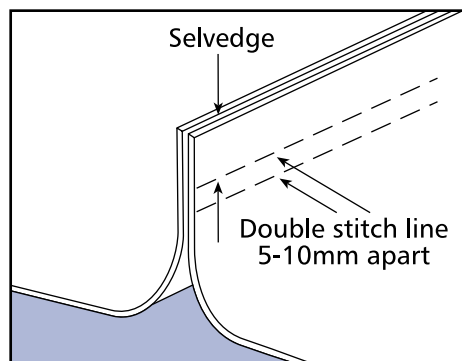


Fig 4 Face to Face ("Prayer") Seam

Joining Methods

TERRAM

Geosynthetics

data

P1 Installation GB01
September 2001 • 3 of 4

To achieve higher levels it will be necessary to use aramid thread (around 420 tex). Ideally actual values obtainable should be evaluated from sample testing. It is also worth noting that factory controlled seaming using more robust sewing equipment under more ideal processing conditions is likely to produce superior results to on-site sewing.

Portable sewing machines powered electrically (mains/battery) can be hired from Terry Lovell.

Polyester threads are obtainable from:

(a) Terry Lovell, Eclipse Sewing Machines

Des Centre
Horley Road
Skipple Hill
Bristol, BS16 4QT
Tel/Fax: 0117 9570198

(b) Coats-Barbour

Netherplace
Newton Mearns
Glasgow G77 6PP
Tel: 0141 6161000
Fax: 0141 6161060

(c) A. J. Worthington Group plc

Portland Mills
Queen Street, Leek
Staffs ST13 6LW
Tel: 01538 399600
Fax: 01538 371968

On most grades of non woven Terram, the single seam "face to face" joint (*see Fig 3*) is satisfactory since it produces a strength equivalent to about 75% of the fabric strength.

When sewing selvedge to selvedge a double stitched "face to face" seam (*see Fig 4*) is generally satisfactory. Where the fabric is cut, a lapped "J" seam will be necessary to avoid stitch slip (*see Fig 5*), although the practical difficulty of this with thick fabrics or in wet conditions should be well understood. 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.

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, it is well to be aware of the potential problems in terms of construction site conditions, as for example: a cut thread can lead to unthreading problems; dampness can cause thread or needle break; bobbins need covering (a plastic bag will serve the purpose to keep the yarn clean and dry).

It is essential to keep machines in good order and close liaison with the sewing machine manufacturer's representative is recommended.

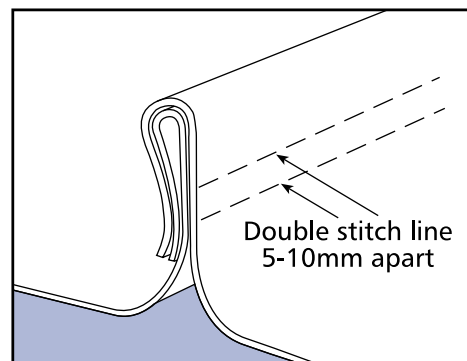


Fig 5 Lapped ("J") Seam

Joining Methods

Stapling

Terram can be joined by stapling, preferably using a lapped seam (*Fig 7*), and an industrial stapling device. Seam strengths are likely to be much lower than those achievable by sewing.

A suitable stapling machine is the Rosetto Universa 73 Plier, obtainable from:

- (a) J & H Rosenheim & Co. Ltd
Lancaster Fields Gateway
Crewe
Cheshire CW1 6FF
Tel: 01270 585959

Another machine from the same company, the Rosetto carbon stapler model DWS27, has been used for stapling together combined layers of Terram.

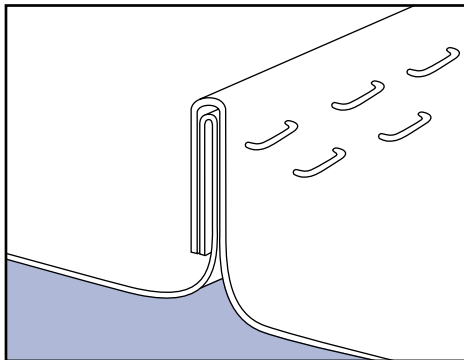


Fig 7 Stapled Seam

Adhesives

Non woven Terram can be joined by gluing, but as the fabric must be clean and dry and have a firm base, this technique is not generally recommended for site.

However, with a simple glued overlap of 100mm, a good seam strength can be achieved using a hot melt glue under controlled conditions. The hot melt adhesive should be applied in accordance with the manufactures instructions. Pressure must be applied to the join in order to force the glue into the fabric. Pressure may be applied by standing on the join.

Hot melt adhesive and applicator guns are obtainable from:

- (a) The Adhesive Company (AHS)
51 Church Walk South
Rodbourne Cheney
Swindon
Wiltshire SN2 2JE
Tel: 01793 421905