MACCAFERRI

INSTALLATION GUIDELINES

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MACMAT® & MACMAT® R

MULTI-FUNCTIONAL GEOCOMPOSITE FOR SURFACE STABILISATION

General

MacMat® and MacMat® R are three-dimensional erosion control mats composed of UV stabilised synthetic fibres. MacMat® R is additionally reinforced with double twisted steel wire mesh or with a synthetic geogrid (with a range of tensile strengths) within the polymer matrix.

The products are supplied in rolled form. MacMat® R, with steel mesh reinforcement, is manufactured with a rough and a smooth surface. In general, the smooth side is placed onto the surface to be protected, although in some situations it can be placed outermost if required. MatMat® R with synthetic geogrid reinforcement has the standard cuspated matrix profile as unreinforced MacMat.

Surface Preparation:

1. Grade and lightly compact the slope to an even surface, filling in surface depressions as required.
2. Prepare a level anchorage zone and trench on firm subsoil around the perimeter of the installation.
3. Leave the last 25-50mm layer of top-soil loose to minimise soil pockets and allow the seed to take hold upon the embankment slope.
4. When used as an erosion control mat, it is suggested that the seed and fertilizer are applied either directly to the top soil prior to placing the MacMat®, or after the installation with hydro-seeding.
5. When used as a turf reinforcement, it is suggested that the top soil and seed (or hydro-seed) are applied after the MacMat® has been installed.

Tie-down trenching

1. A simple fold into the slope is normally sufficient to anchor the perimeter of the mat to the ground.
2. For erodible soils, excavate a trench approximately 300mm deep by 500mm wide, at least 0.5m back from the edge of the slope and anchor the mat along the bottom of the trench. Note that in the case of reinforced mats, the size of the trench must be properly designed to provide the required anchorage strength.
3. Backfill and compact the soil to an even surface.
4. Initially, lay mat loosely on the soil surface to prevent forming soil pockets. Pin the mat into larger impressions on the slope to limit voids between the mat and the slope.

Fixing:

Steel fixing pins are used to secure the MacMat® to the surface. Site trials are to be carried out to determine the most appropriate fixing and frequency. However, in most circumstances the following fixings have been found to be suitable;

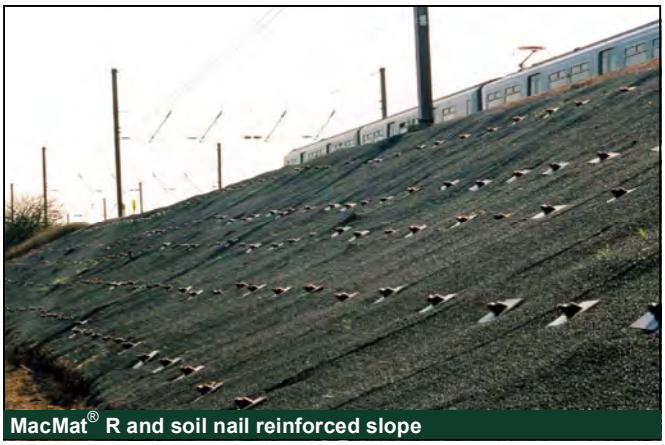
- Unreinforced MacMat®: 4-8mm diameter steel pins with asymmetric 300mm / 100mm long legs
- Reinforced MacMat R®: 8mm diameter steel pins with asymmetric 300mm / 100mm long legs

The frequency of pinning is to be determined by the project engineer and is dependent upon slope angle, surface soil type and in the case of hydraulic applications, the shear stresses expected. The following is general guidance only:

Fixing MacMat in trench

MacMat® R erosion protection on river bank

Connecting adjacent panels of MacMat® R with 'hog-rings'



MacMat® R and soil nail reinforced slope

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1. Space anchor pins at 1m intervals along the top edge of the embankment slope and along the bottom of the anchor trench.
2. In most circumstances a pinning frequency of 1 pin/2m^2 for MacMat® and 1 pin/1.5-1.7m^2 for MacMat® R (excluding perimeter fixings) is suitable.
3. For slope angles of up to 1:1, and channel linings, use 1m anchor pin spacing for the direction perpendicular to the angle of slope and 1.2m interval spacing (staggered) for the direction parallel to the angle of slope.
4. Greater fixity will be required on slopes steeper than 1:1 (V:H). Comply with the project engineer's recommendations.
5. When MacMat® R (with steel mesh reinforcement) is used in conjunction with soil nails in reinforced slopes, additional fixing may not be required. Secure MacMat® R using anchor plates and nuts as required by the project.
6. Install fixing pins perpendicular to the mat (engaging the woven wire mesh within MacMat® R) and drive flush with the soil surface to provide the required pull-out resistance.
7. Adjacent panels of unreinforced MacMat® or MacMat® R reinforced with synthetic geogrid, are to be overlapped by 100mm (min.) and pinned.
8. Adjacent panels of MacMat® R (with steel mesh reinforcement) does not need to be overlapped. The integral steel wire mesh enables panels to be connected by a butt-joint using lacing wire, "fixing rings" or fixing pins, depending upon the application.

Channel linings

1. Lay the MacMat® parallel to the direction of the flow for smaller channels and perpendicular to the direction of flow for larger channels or channels with steeper slopes.
2. Overlap the edges of the mat by 300mm.
3. Always overlap so that the downstream edge is anchored below the upstream edge.

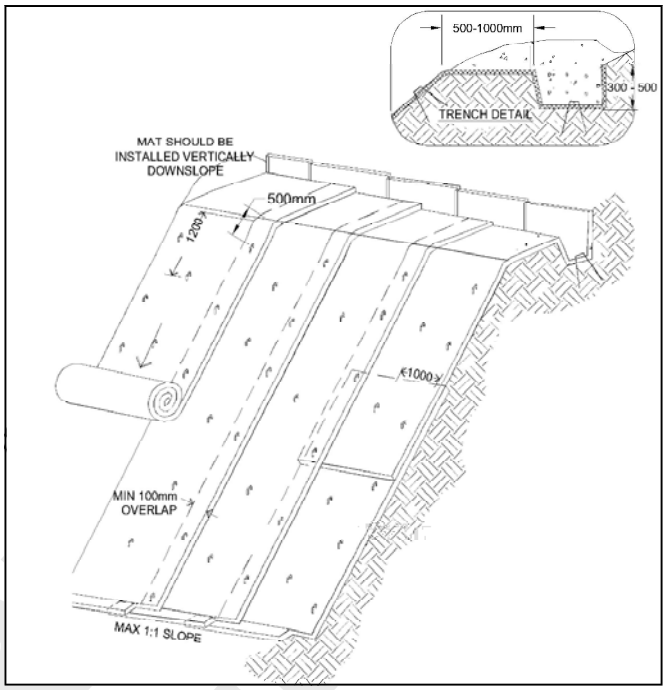
Fixing mats on membranes

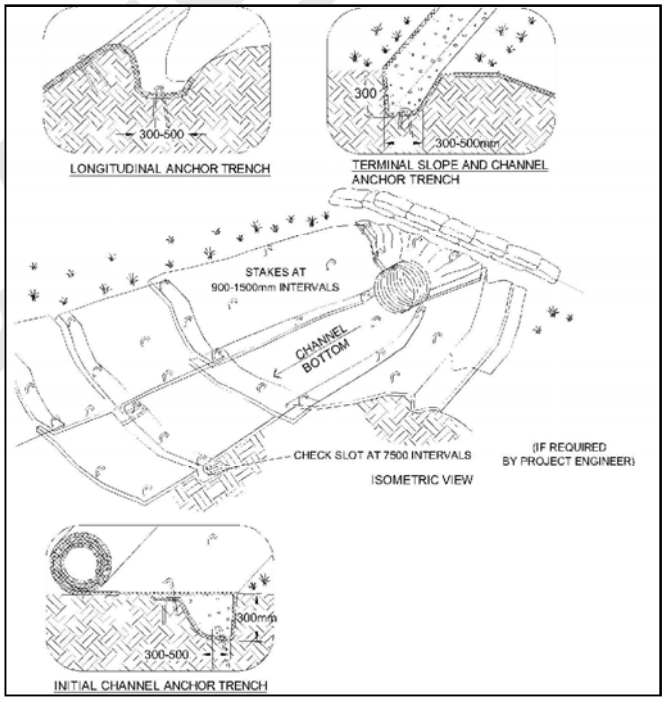
When using reinforced MacMat on top of waterproofing synthetic membranes and geosynthetic clay liners, fixing pins should not be used as they will puncture the membrane. Mats are simply anchored in the top trench and, if necessary, in intermediate berm trenches. These applications may have specific technical and installation requirements.

Finishing

Brush topsoil to a depth of 20mm into the three-dimensional matrix of the MacMat® to cover the mat.

For further details, guidance and project specific assistance, please contact your local Maccaferri office.





Please note that these products cannot guarantee vegetation establishment. This is a function of numerous variables including the quality of topsoil, presence of nutrients, moisture, viable seeds and appropriate sunlight and oxygen. Please consult Maccaferri for further guidance.

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