Procedure for the construction of Green-faced Slopes

This advice is given in good faith to help customers to achieve the best possible results in situations where E'GRID Geogrids are appropriate materials for the construction of a green-faced Steep Slope project. Because the conditions of such projects vary so much no guarantee can be given by BOSTD Geosynthetics Qingdao Ltd. or NewGrids Limited that these products or this guidance are suitable for any particular project. In all circumstances instructions given by an engineer associated with the project take precedence over this guidance.

Cut edges of geogrids can be sharp. Gloves to protect hands should be worn during handling and installation of E'GRID geogrids.

General Notes:

1: Total Length of each piece of primary reinforcement geogrid:

At each level of primary reinforcement except the top level the length of each piece of geogrid (L) is :

L = • Design length of embedment of that level of geogrid
+• Distance up slope to next level of primary reinforcement
+• 0.5m for upper embedment and bodkin joint

The length of each piece at the top level of primary reinforcement of a tier of the structure (L_T) is :

L_T= • Design length of embedment of that level of geogrid
+• Distance up slope to the top of the tier
+• 1.5m to wrap over the top sandbags and be buried at least 0.3m below the surface of the tier.

2: Foundation:

These notes assume that a level, well-compacted, firm foundation with sufficient bearing capacity for the loads of the steep slope and any surcharge has been provided in accordance with the design and to the engineer's satisfaction.

3: Compaction of sandbag face and fill behind:

Within 1.5m of the face of the structure, including the sandbags at the face, only light compaction equipment may be used. Behind that heavier, smooth roller compaction equipment may be used if the scale of the project justifies this. In the 1.5m face zone lift heights for compaction must be 150mm or less to enable good compaction by the light equipment.

Sequence of Construction:

1: As per drawing, make template for slope line to be used with a vertical level as each lift is placed to ensure that the face is built to the designed angle of inclination.

2: Mark out the line of each face on the structure on the ground.

3: Prepare cut lengths of the grade of geogrid required for the base layer reinforcement

4: Lay the lengths of geogrid on the foundation with each perpendicular to the face of the structure at that point and with the designed embedment length behind the line of the face.

Figure 1: Geogrid pieces held in place

The edge of each piece of geogrid must be touching, but not overlapping, the edges of the adjoining pieces at the line of the face. Hold the pieces of geogrid in place either by placing some fill on them or with stakes, e.g. as shown in Figure 1. Behind curved faces or at corners where pieces of geogrid overlap behind the face, place a thin layer of fine fill (say 10-20mm thick) between the overlapped pieces to ensure that a low-friction plane is not generated.

5: Build the face of the structure with sandbags filled with an appropriate mixture of soil, seeds and fertilizer up to the depth of the first compaction lift.

6: Carefully place fill vertically onto the geogrid to the depth of the first compaction lift and compact both the fill and the sandbag face. If necessary add water to the fill to enable good compaction.

Use a “cricket bat” as shown in Figure 2 to maintain a flat surface of the face at the correct angle during construction and compaction.

7: Continue placing and compacting face and fill to the level of the next layer of primary reinforcement.

Figure 2: Maintaining face angle

8: Bring the end of the geogrid piece outside the face up over the face and onto the fill. As shown in Figure 3. Place the next layer of geogrid onto it and join the two layers with a bodkin joint as shown in Figures 4 and 5.

9: Pull the grid over the face tight by pulling the new layer of geogrid back with levers or a suitable tensioning device and stake it in position as shown in Figure 1.

Figure 3: Lifting Geogrid over face

Figure 4: Gegrids connected

Figure 5: Bodkin Joint

10: Continue building the structure by repeating steps 5 to 9, taking care with overlaps at curves and corners as described in step 4, until the top of the tier of the structure is reached.

11: At the top of the tier, wrap the last layer of Geogrids up around and over the sandbags and bury it into the fill behind the sandbags to a depth of at least 300mm.