SANDBAG RETAINING WALLS ADAPTED FOR PLANT GROWTH

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ABSTRACT
The sandbag for use in constructing retaining walls having a vegetation-covered wall face. The sandbag contains soil mixed with seeds as a first fill material at one end of the bag, and the remainder of the bag is filled with a cheaper fill material such as sand or gravel. The sandbags are arranged in a sandbag wall such that the ends of the bags having the soil and seed mixture forms at least part of the outer face of the wall.
SANDBAG RETAINING WALLS ADAPTED FOR PLANT GROWTH

TECHNICAL FIELD

[0001] The invention pertains to sandbag wall systems for use in erosion control, flood protection, coastal protection, slope stabilization and similar applications, and to improved bags and walls.

BACKGROUND OF THE INVENTION

[0002] In the art of erosion control, flood protection, coastal protection, slope stabilization and the like, it is known to build strong and effective retaining walls made with sandbags, preferably using interconnecting members to connect the bags together and stabilize the wall. See, for example, International patent publication WO 00/61880 (Kim) dated Oct. 19, 2000. It is often desirable to grow vegetation on the face of a sandbag retaining wall, both for aesthetic reasons and to provide additional protection to the wall face. This can be done by using soil mixed with grass seed or other plant seeds as a fill material. The bags are made of geotextile or other material which permits plants to grow out through the bag walls. As the seeds in the filled bags germinate and plants grow out through the bag walls, the wall face acquires a cover of vegetation.

[0003] Soil of a quality sufficient to facilitate the growth of an adequate vegetation cover, mixed with seeds, is a relatively expensive fill material for use in sandbags. It would be desirable to reduce the cost while still being able to grow a vegetation cover on sandbag walls.

SUMMARY OF THE INVENTION

[0004] The invention is based on the principle that it is possible to grow vegetation on a sandbag wall by using sandbags that are not completely filled with soil, but have soil as a fill material at one end of the bag, while the rest of the bag is filled with other, cheaper, fill materials.

[0005] The invention provides a sandbag for use in the construction of sandbag walls. The bag has a bag wall, a first end and a second end and the sandbag is filled with two or more types of fill material, a first type of fill material, preferably soil mixed with plant seeds, being at the first end of the bag and a second type of fill material being spaced from the first end.

[0006] The invention also provides sandbag walls comprising multiple courses of such sandbags. The sandbags are arranged such that the ends that contain the soil form at least part of the outer face of the wall.

[0007] In this specification “fill material” means any material that is suitable for use in bags in the construction of walls, including sand, soil, gravel, dry mix concrete (which hardens after wetting and curing) and mixtures thereof, including fill material with seeds for vegetation. The term “sandbag” as used herein means a bag containing any “fill material”. For further clarity, the term is not limited to a bag in which the fill material is sand. The term “soil” includes any solid materials that are suitable for use in sandbags to support the growth of plants from seeds mixed therewith. The term “wall” as used herein in relation to structures made of sandbags includes any array of sandbags that is suitable for the purpose of erosion control (for example along shorelines, riverbanks, etc.), flood control, retaining or stabilizing slopes or embankments, noise barriers, landscaping, and for similar applications.

BRIEF DESCRIPTION OF DRAWINGS

[0008] FIG. 1 is a perspective view of a sandbag according to an embodiment of the invention.

[0009] FIG. 2 is a perspective view of one course of sandbags of a sandbag wall.

[0010] FIG. 3 is a cross-sectional view of a sandbag wall.

[0011] FIG. 4 is a top plan view of a course of sandbags of a sandbag wall according to another embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0012] In the following description and drawings, corresponding and like parts are referred to by the same reference characters.

[0013] With reference to FIG. 1 of the drawings, sandbag 10 comprises a bag 12 filled with fill material 24. The bag has a wall 14, a closed bottom end 16 and a top end 18, which has opening 20 that is closed by means of a tie 22. The sandbag is accordingly sealed to retain the fill material within its interior. The bag 12 is preferably made of geotextile and is formed of a single piece thereof by sewing along the bottom and a longitudinal side of the bag.

[0014] Sandbag 10 has a length L between its opposed ends 16, 18, and a width W, and a depth, the length being greater than the width.

[0015] Fill material 24 comprises soil 24A mixed with plant seeds, which is put at the bottom end of the bag, and a second fill material 24B, which may be sand, gravel, etc., depending on the particular application and the availability of such fill materials. If desired, mixtures of relatively inexpensive fill materials may be used for fill 24B.

[0016] The soil 24A may fill any selected proportion of the bag volume. For example, the soil may fill one-quarter, one-third, one-half, etc. of the bag volume. Generally, it is desirable that the amount of soil be sufficient to support the proper growth of vegetation, but for reasons of economy not more than that. In some cases, the selection will depend on the particular application and the fill materials used. For example, a sandbag with about one-third of the bag volume filled with soil and about two-thirds with dry mix concrete would be suitable for an erosion control application where land and water meet, as along a shoreline or the embankment of a river or stream.

[0017] Referring FIGS. 2 and 3, sandbags 10 are assembled into a wall 50 comprising a plurality of generally horizontal courses. Configurations of sandbags forming retaining walls and other erosion control structures are well known in the prior art, for example WO 00/61880, and bags 10 can be employed in such configurations. Retaining wall 50 comprises multiple generally horizontal courses 30 of sandbags, the courses being arranged in a generally vertical or sloping configuration. In the present invention, the bags in each course 30 are laid so that the bottom end 16 of the bags, containing the soil/seed mix, is adjacent to the outer
(i.e. exposed) face 32 of the wall and the opposite end 18 of the bags is adjacent the inner side 34 of the wall, i.e. adjacent to the backfill or slope 36 that is in back of the wall. The sandbags 10 are accordingly positioned such that the soil/seed fill material is at the outer face of the wall, to facilitate the growth of vegetation on the wall face. This both enhances the appearance of the wall and protects the bags from exposure to sunlight and weather.

[0018] Optionally, and preferably, interconnecting members 25 are used to attach adjacent sandbags together, to strengthen the retaining wall. The interconnecting members comprise a plate 27 having projections 29 on both sides thereof which project into sandbags of vertically-adjacent courses and into horizontally-adjacent sandbags. They may be of the types described in WO 00/61880 (Kim).

[0019] The sandbags 10 of the invention may be used in wall structures in conjunction with other sandbags which have only a single fill material. FIG. 4 shows one example of such an arrangement, out of the many possible arrangements that can be made. Course 40 of the wall comprises sandbags 10 alternating with sandbags 42 which have only a single fill material. If it is desired to grow vegetation on the entire wall, the fill material for sandbags 42 would preferably be soil mixed with seeds. The sandbags 10 are positioned such that end 16 of the bags is adjacent to the outer face 32 of the wall.

[0020] While exemplary embodiments have been discussed above, those of skill in the art will recognize that certain modifications thereto may be made. It is intended that the following appended claims are interpreted to include all such modifications, as are within their true scope.

1. A sandbag for use in the construction of sandbag walls, comprising a bag wall, a first end and a second end, wherein said sandbag is filled with at least two types of fill material, a first type of fill material being at said first end and a second type of fill material being spaced from said first end. Said sandbag comprises at least two types of fill material.

2. A sandbag according to claim 1 wherein said sandbag has a length and a width, said length being greater than said width, and said first and second ends are at opposed ends of a longitudinal axis of said sandbag.

3. A sandbag according to claim 1 wherein said first fill material comprises soil.

4. A sandbag according to claim 2 wherein said first fill material comprises soil.

5. A sandbag according to claim 1 wherein said first fill material comprises soil and plant seeds.

6. A sandbag according to claim 2 wherein said first fill material comprises soil and plant seeds.

7. A sandbag according to claim 3 wherein said second fill material comprises one or more of sand, gravel and dry mix concrete, or mixtures thereof.

8. A sandbag according to claim 4 wherein said second fill material comprises one or more of sand, gravel and dry mix concrete, or mixtures thereof.

9. A sandbag according to claim 5 wherein said second fill material comprises one or more of sand, gravel and dry mix concrete, or mixtures thereof.

10. A sandbag according to claim 6 wherein said second fill material comprises one or more of sand, gravel and dry mix concrete, or mixtures thereof.

11. A sandbag according to claim 1 wherein said sandbag comprises geotextile.

12. A sandbag according to claim 8 wherein said sandbag comprises geotextile.

13. A sandbag wall comprising multiple courses of sandbags according to claim 1.

14. A sandbag wall comprising multiple courses of sandbags, said sandbags comprising a bag wall, a first end and a second end, wherein said sandbags are filled with at least two types of fill material, a first type of fill material being at said first end and a second type of fill material being at said second end.

15. A sandbag wall according to claim 14 wherein said first fill material comprises soil and said second fill material comprises one or more of sand, gravel and dry mix concrete, or mixtures thereof.

16. A sandbag wall according to claim 14 wherein said bag has a length and a width, said length being greater than said width, and said first and second ends being at opposed ends of a longitudinal axis of said sandbag.

17. A sandbag wall according to claim 15 wherein said sandbags are arranged such that said first ends of said sandbags form at least part of an outer face of said wall.

18. A sandbag wall comprising multiple courses of sandbags, said sandbags comprising a bag wall, a first end and a second end, said sandbags being filled with at least two types of fill material, a first type of fill material being at said first end and a second type of fill material being spaced from said first end towards said second end, said bag having a length and a width, said length being greater than said width, and said first and second ends being at opposed ends of a longitudinal axis of said sandbag, said first fill material comprising soil and said second fill material comprising one or more of sand, gravel and dry mix concrete, or mixtures thereof.

19. A sandbag wall according to claim 18 wherein said sandbags are arranged such that said first ends of said sandbags form at least part of an outer face of said wall.

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