Claims

1. A geotechnical apparatus comprising:

a geotextile; and

at least one drainage conduit coupled onto the geotextile and arranged to receive vacuum pressure,

wherein the apparatus is configured to be flexibly arranged into a roll for storage

wherein in use, the apparatus is embedded in soil, and vacuum pressure is introduced into the drainage conduit to enable fluid in the soil to be drawn thereinto to be drained for consolidating the soil.

2. The apparatus of claim 1, wherein the at least one drainage conduit includes a plurality of drainage conduits.

3. The apparatus of claim 2, wherein the plurality of drainage conduits are in an evenly spaced arrangement.

4. The apparatus of any preceding claims, wherein the drainage conduit is formed of a flexible polymer, which includes plastics.

5. The apparatus of any preceding claims, wherein the drainage conduit is coupled parallel to the longitudinal axis of the geotextile.

6. The apparatus of any preceding claims, further comprising a geotechnical fabric for coupling the drainage conduit to the geotextile.

7. The apparatus of any preceding claims, wherein the geotechnical fabric includes a filter sleeve.

8. The apparatus of claim 6 or 7, wherein the coupling is enabled by gluing or heat melting the geotechnical fabric to collectively the drainage conduit and geotextile.

9. The apparatus of any preceding claims, wherein the drainage conduit has a plurality of internal conduits, further comprising at least two electrodes arranged within respective internal conduits, and configured to electrically be operated as anodes or cathodes.

10. The apparatus of claim 9, wherein each electrode is formed of titanium, stainless steel, copper, or copper coated with mixed metal oxide.

11. The apparatus of any preceding claims, wherein the drainage conduit includes being configured to be fluid permeable.

12. A method of using a geotechnical apparatus, which includes a geotextile and at least one drainage conduit coupled onto the geotextile and arranged to receive vacuum pressure, the apparatus configured to be flexibly arranged into a roll for storage, the method comprises:

(i) providing the apparatus on a first layer of soil;

(ii) providing a second layer of soil on the apparatus to embed the apparatus within the first and second layers of soil; and

(iii) introducing vacuum pressure into the drainage conduit to enable fluid in the soil to be drawn thereinto to be drained for consolidating the soil.

13. The method of claim 12, further comprises:

coupling the drainage conduit to a vacuum pump configured to generate the vacuum pressure.

14. A geotechnical apparatus comprising:

a geotextile;

at least one drainage conduit coupled onto the geotextile and arranged to receive vacuum pressure; and

at least two electrodes arranged within the drainage conduit, and configured to electrically be operated as anodes or cathodes,

wherein the apparatus is configured to be flexibly arranged into a roll for storage,

wherein in use, the apparatus is embedded in soil, and vacuum pressure is introduced into the drainage conduit to enable fluid in the soil to be drawn

thereinto to be drained for consolidating the soil, and/or the electrodes are operated to electrically direct the fluid in the soil towards/away from the apparatus to be drained.

15. The apparatus of claim 14, wherein each electrode is formed of titanium, stainless steel, copper, or copper coated with mixed metal oxide.

16. A method of using a geotechnical apparatus, which includes a geotextile, at least one drainage conduit coupled onto the geotextile and arranged to receive vacuum pressure, and at least two electrodes arranged within the drainage conduit, and configured to electrically be operated as anodes or cathodes, the apparatus configured to be flexibly arranged into a roll for storage, the method comprises:

(i) providing the apparatus on a first layer of soil;

(ii) providing a second layer of soil on the apparatus to embed the apparatus within the first and second layers of soil; and

(iii) introducing vacuum pressure into the drainage conduit to enable fluid in the soil to be drawn thereinto to be drained for consolidating the soil, and/or operating the electrodes to electrically direct the fluid in the soil towards/away from the apparatus to be drained.

17. The method of claim 16, further comprises:

coupling the drainage conduit to a vacuum pump configured to generate the vacuum pressure.

18. The method of any of claims 16-17, wherein step (iii) includes:

providing a similar second geotechnical apparatus on the second layer of soil;

providing a third layer of soil on the second apparatus to embed the second apparatus within the second and third layers of soil; and

operating the electrodes of the second apparatus cooperatively with operating the electrodes of step (iii) to electrically direct the fluid,

wherein the electrodes of the apparatus are configured as anodes, and the electrodes of the second apparatus are configured as cathodes, or the

electrodes of the apparatus are configured as cathodes, and the electrodes of the second apparatus are configured as anodes.

19. The method of claim 18, wherein the fluid is electrically directed to generally flow in a direction from the anode to the cathode.

20. A geotechnical apparatus comprising:

a drainage conduit arranged to receive vacuum pressure, and configured to be couplable onto a geotextile; and

at least two electrodes arranged within the drainage conduit, and configured to electrically be operated as anodes or cathodes,

wherein the apparatus is configured to be flexibly arranged into a roll for storage.

21. The apparatus of claim 20, wherein the drainage conduit has a plurality of internal conduits, and the at least two electrodes are arranged within respective internal conduits.