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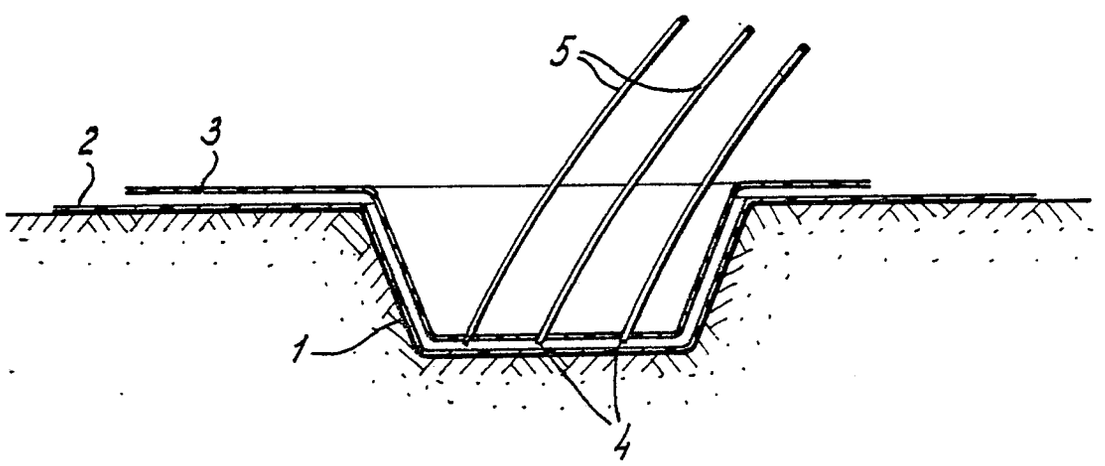
(54) Method for providing of a foundation and foundation.

(57) Foundation comprising a body (6) of cellular concrete being at least partially arranged in an opening (1). Between body (6) and opening (1) a a layer of particulate material (7) is provided. This particulate material (7) has such properties and pore size that when it is absorbed in the porous cellular concrete (6) the pores of the cellular concrete are sealingly filled.

Fig - 1



EP 0 355 208 A1

Method for providing of a foundation and foundation.

This invention relates to a method for providing of a foundation in an opening comprising introducing of cellular concrete.

Such a method is generally known in the art. Cellular concrete is used because of its low specific gravity. By using of such material it is possible to give the structure comprising this foundation as well as the tarmac layer of a road or further layers or for instance top layers of a railway, such a weight that it just "floats" in the opening provided in the soil. However, it is a drawback of cellular concrete that it can absorb water, in which case its specific gravity will increase, such that the effect of "floating" will be lost. Because of this until now the authorities did not give permission to simply use cellular concrete where the possibility might arise that by absorption of water the structure could sink. A solution for this problem in the prior art was to introduce a sheet of foil after excavating of an opening in which the cellular concrete was simply poured. However, this solution has the draw back that it cannot be guaranteed that over the years said foil will remain closed and undamaged.

It is the aim of the invention to provide a method by which it is guaranteed that during the years of use of the structure, ingress of water from the soil will not have any substantial effect on the weight of the structure.

According to the invention this is realized with a method as described above in that after at least partially curing of the cellular concrete being introduced, a layer of particulate material is introduced near at least a part of the interface boundary opening-cellular concrete, wherein said particulate material has a particle size filling and sealing the pores of the said cellular concrete. After introducing of this particulate material, which will remain permanently near the interface, any movement of water to the cellular concrete foundation will also move the particulate material such that the cellular concrete body is sealed off by the particulate material. Preferably said particulate material is supplied as slurry. To guarantee an even distribution of the particulate material and to eliminate effects of the soil as well as of the concrete body, a foil sheet is provided in the opening. Furthermore a second foil sheet can be provided and in this case the particulate material is introduced between both foil sheets.

According to a further preferred method of the invention before introducing of the cellular concrete, feed means are provided by which it is possible to later introduce the particulate material. Preferably the specific gravity of the particulate material introduced is such that floating of the structure comprising the foundation is prevented. For obtaining an even distribution it might be preferable to introduce a washing fluid, such as water, before introducing of the particulate material. This particulate material can comprise bentonite known for its flowability.

The invention also relates to a foundation comprising a body of cellular concrete at least partially provided in a humid place, said body being at least partially delimited by a particulate material having a pore size sealingly filling the cellular concrete. Further advantageous embodiments will be clear from the sub claims.

The invention will now be elucidated with reference to an exemplary embodiment shown in the drawing in which:

Fig. 1 shows a first stage of the method according to the invention and

Fig. 2 a later stage of the method according to the invention.

In fig. 1 an opening excavated in the soil is generally indicated with 1. In this opening a foil sheet 2 of foil material is introduced after which a further sheet 3 of foil material is provided. Said last sheet is provided with a number of openings 4 connected to tubes 5. After arranging of the tubes 5 cellular concrete 6 is introduced as shown in fig. 2. After this the extremeties of foil sheet 3 can be moved inwardly. After at least partially curing of the concrete through tubes 5, and possibly further finishing of the structure for example by providing a tarmac layer 10, a particulate material such as bentonite is introduced. This particulate material will distribute between sheets 2 and 3 and is indicated with 7. Introducing of particulate material through tubes 5 is continued until particulate material leaves at 8, such that it is guaranteed that all around the cellular concrete body 3 particulate material 7 is provided. The specific gravity of the cellullar concrete is chosen such that in combination with tarmac layer 10 the total weight of this structure is such that it just floats in opening 1. Because of this in an instable soil it is no longer necessary to excavate a large opening and to fill this with reinforcing material, not only being costly but in many cases also giving raise to later depression and rising of the structure made. It is also possible to reinforce the concrete body 3 at its lower end by a reinforcement.

If this reinforcement is non porous it is not necessary to provide particulate material at a lower part of the concrete body 3.

The arrangement according to the invention of the layer of bentonite material functions as follows: if during use water ingresses through the foil films

2 and/or 3 it takes some parts of the layer of particulate material 7 with it. The particle size of this particulate material is such that the pores of the cellular concrete are filled and sealed by it. In this way there is a stand by means for sealing of the porous body 3 which will still be functioning after the prolongued service life of the structure. It is of course possible to delete one or two of the foil films 2 and 3. If the particulate material is introduced under the body 3 it is of importance that its specific gravity is lower than the weight of body 3 possible including tarmac layer 10. By this measure it can be prevented that body 3 will float upwardly and it can be assured that particular material 7 will be evenly distributed around body 3. However, to promote distribution it is possible to introduce underneath or beside body 3 spacer means and/or duct forming means. Introducing of the particulate material can be realized with a relative low overpressure. By using of the invention lighter foil qualities can be used for sheets 2 and 3 than in the prior art whilst guaranteeing that when water is entering the cellular concrete it is immediateely sealed. With the heavier quality of foil according to the prior art it can never be guaranteed that no opening will be present in the foil over the years of use. For obtaining a flow path of the particulate material it is possible to first introduce washing fluid through tubes 5.

Although the embodiment described above is a preferred embodiment it will be clear that many amendments can be introduced being obvious for the person skilled in the art and being within the scope of the appended claims.

Claims

1. Method for providing a foundation in an opening, comprising introducing of cellular concrete and after at least partially curing thereof introducing of a layer of particular material having a size sealingly filling the pores of the cellular concrete near at least a part of the interface boundary of the opening-cellular concrete.

2. Method according to claim 1, wherein said particular material is added as slurry.

3. Method according to one of the preceeding claims, wherein before introducing of the cellular concrete at least one foil sheet is provided in said opening.

4. Method according to one of the preceeding claims, wherein before introducing of the cellular concrete two foil sheets are provided and wherein after at least partially curing of the cellular concrete the particulate material is introduced between said foil sheets.

5. Method according to one of the preceeding claims, wherein before introducing of the cellular concrete feed means for the particulate material are arranged.

6. Method according to one of the preceeding claims, wherein the specific gravity of the particulate material is chosen such that rising of the structure comprising the foundation is substantially prevented.

7. Method according to one of the preceeding claims, wherein before introducing of the particulate material a washing fluid is introduced.

8. Method according to one of the preceeding claims, wherein the particulate material comprises bentonite.

9. Foundation comprising a body of cellular concrete at least partially provided in a humid place, wherein said body is at least partially limited by particulate material having a particle size sealingly filling the pores of the cellular concrete.

10. Foundation according to claim 9, wherein said place comprises an opening being provided in the ground.

11. Foundation according to claim 9 or 10, wherein between said particulate material and said cellular concrete a layer of foil sheet is provided.

12. Foundation according to one of the claims 9-11, wherein between said particulate material and the place where the foundation is realized a layer of foil sheet is provided.

13. Foundation according to one of the claims 9-12, wherein near the lowest point of the foundation feed means are provided for the particulate material.

14. Foundation according to one of the claims 9-13, wherein means are provided to assist in spreading of the particulate material.

Fig-1

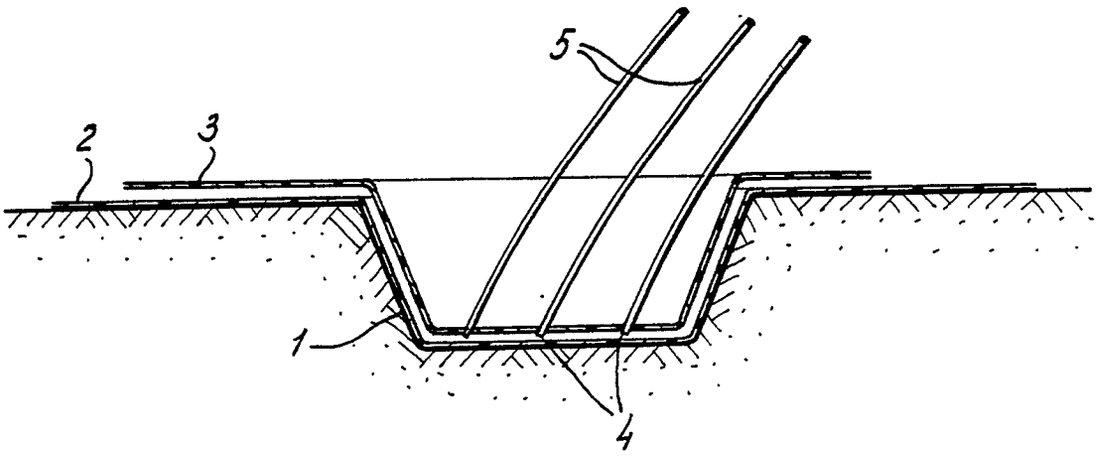
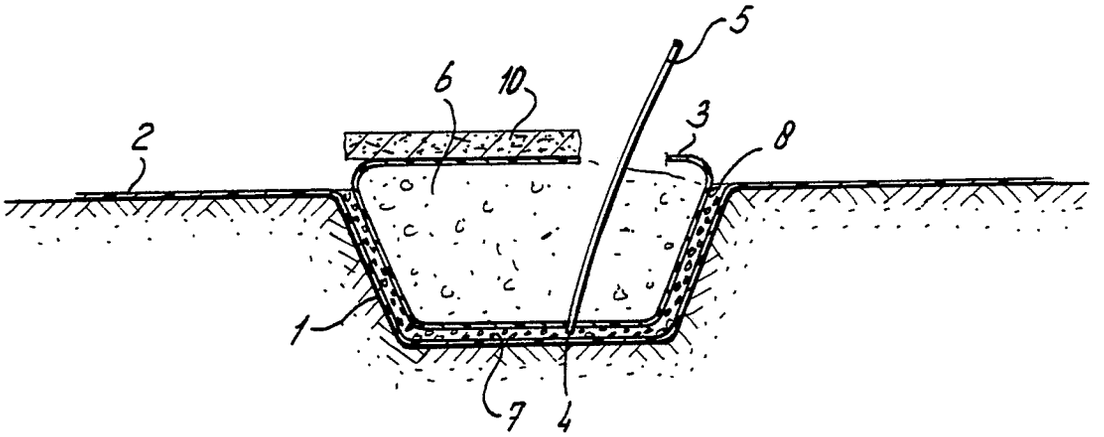


Fig-2



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EUROPEAN SEARCH REPORT

Application Number

EP 88 20 1807

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	FR-A-2 104 055 (STAHLWERKE PEINE-SALZGITTER) * Page 1, lines 8-21,31-36; page 2, lines 1-5,31-36; page 3, lines 1-5; page 4, lines 6-9,16-37; page 5, line 1; figures 1-3 *	1,3,9	E 01 C 3/00 E 01 C 3/02 E 02 D 27/36
A	NL-A-6 410 678 (GELSENKIRCHENER BERGWERKS-AG) * Page 3, lines 11-27; page 4, lines 30-36; page 5, lines 1-11; figures 1,2 *	1,3,8, 11	
A	NL-A-6 810 346 (SHELL) * Page 5, lines 7-21; figure 4 *	1,10	
A	NL-A-8 501 116 (VOORBIJ'S BETON BV) * Page 2, lines 23-28; page 3, lines 11-33; page 5, lines 5,6,19-23; figure 1 *	1,3,6,8 ,10,12	
A	DE-C- 723 903 (BERNATZIK) * Page 2, lines 116-122; page 3, lines 1-4,31-37; figures 1,2 *	3,4,5,7 ,10	TECHNICAL FIELDS SEARCHED (Int. Cl.4) E 01 C E 02 D
A	US-A-3 839 518 (RUBENS) * Column 6, lines 36-47; figures 2,4 *	4,11,12	
A	GB-A- 525 699 (PICKETT)		
A	US-A-3 283 518 (TOFFOLON)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20-04-1989	RUYMBEKE L.G.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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