

PATENT SPECIFICATION

(11)

1301320

DRAWINGS ATTACHED

- (21) Application No. 55693/70 (22) Filed 23 Nov. 1970
(31) Convention Application No. 6917636 (32) Filed 22 Nov. 1969 in
(33) Netherlands (NL)
(45) Complete Specification published 29 Dec. 1972
(51) International Classification E02D 5/02
(52) Index at acceptance E1H 2B



(54) SHEET PILING

(71) We, N.V. TOT AANNEMING VAN WERKEN VOORHEEN H. J. NEDERHORST, of Turfmarkt 8, Gouda, Holland, a Dutch company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a method of assembling sheet piling in the earth from sheet pile sections which are each provided on opposite edges with locking channels.

When introducing sheet pile sections into the earth by ramming or vibrating, difficulties are frequently encountered which are not due solely to resistance of the earth but which are chiefly the result of frictional resistance in the locking channels.

It is an object of the present invention to provide a method according to which this frictional resistance in the locking channels is considerably reduced.

According to the invention, there is provided a method of assembling sheet piling in the earth from sheet pile sections each provided on each of opposite edges with a locking channel, comprising sealing a lower end portion of one of the locking channels of a first of the sections, introducing said first section into the earth, feeding a liquid having a low internal friction and a high specific gravity into said one locking channel during the introduction of said first section into the earth, and introducing a second of the sections into the earth, one of the locking channels of said second section engaging with said one locking channel of said first section, the liquid being displaced from said one locking channel as the second locking channel is introduced into the earth.

The liquid prevents or hinders earth from penetrating into the locking channel, so that frictional resistance between the interengaging locking channels during the introduction into the earth of the second sheet pile section is reduced. Because the lower portion of the

locking channel is sealed earth is prevented from penetrating into said locking channel. The liquid serves to prevent earth from penetrating into the portion of the locking channel above the lower end portion.

The invention further provides a sheet silica pile section having a locking channel along each of opposite edges, a lower end portion of one of the locking channels being sealed by a lower end plate and an upright side plate.

The invention also provides sheet piling assembled from said sheet pile section to the method specified in the preceding paragraph but two.

The invention will now be further described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a portion of a sheet pile section according to the invention during its introduction into the earth, the earth in front of the sheet pile section not being shown for greater clarity; and

Figure 2 is a perspective view of the lower part of the locking channel shown in Figure 1, on a larger scale.

In Figure 1 a sheet pile section 1 is shown, which has been rammed or vibrated almost completely into the earth.

The sheet pile section 1 comprises on each of opposite upright edges a locking channel. Figure 1 only shows the locking channel 2 which is remote from the last sheet pile section (not shown) already driven in the earth. Of the two locking channels of the sheet pile section 1, only this locking channel 2 is sealed on its lower end by a lower end plate 3 (Figures 1 and 2) and on the upright open side by an upright side plate 4, which extends from the lower end of the locking channel 2 over part of this locking channel 2. The height of the upright side plate 4 may be in the range from 0.5 to 1.5 metres. The lower end plate 3 as well as the upright side plate 4 may be made of thin sheet steel having a thickness of, for example, 1 millimetre, but the use of other materials is of course also possible.

[Price 25p]

SPECIFICATION AMENDED - SEE ATTACHED SLIP

(11) During the introduction of the sheet pile section 1 into the earth, a liquid having a low internal friction and a high specific gravity is fed into the locking channel 2 shown. The other locking channel of the sheet pile section 1, which is not provided with an end plate 3 or with a side plate 4, engages during the introduction of the sheet pile section 1 with the adjacent locking channel of the preceding sheet pile section which has already been introduced into the earth, the latter locking channel being of the same construction as the locking channel 2.

In the embodiment shown in the drawing, the liquid is first fed into a hole 5 which has been dug into the earth, from where the liquid runs into the locking channel 2.

Alternatively it is possible to flush the liquid through a hose into the locking channel 2.

The liquid used may be bentonite suspension, the stability of which, while maintaining its thixotropic properties, may be enhanced by adding a small amount of cement.

The liquid consistently keeps the locking channel 2 filled to approximately the level of the ground surface and prevents earth from penetrating into the locking channel 2.

During the introduction of the next sheet pile section, an elongate member having a length of a few centimetres, attached underneath the wall portion of the locking channel of said subsequent sheet pile section which interlocks with the sheet pile section 1 that has already been introduced into the earth, is received in the locking channel 2 and is a close fit therein. This member may be rigidly attached to this subsequent sheet pile section and presses the liquid sideways out of the locking channel 2 with its lower end.

The wall portion of the locking channel of the subsequent sheet pile section, which is intended to interlock with the locking channel 2, may be removed over a height from the underside which approximately corresponds to that of the upright side plate 4. Thus the wall portion of the locking channel of the subsequent sheet pile section extends downwards and terminates at a distance from the lower edge of the sheet pile section at least equal to the length of the upright side plate 4.

As an alternative, it is likewise possible to form said upright side plate 4 of a material which is deformed and compressed by the wall of the locking channel of the next sheet pile section during the introduction thereof.

Frictional resistance in the locking channels during the introduction into the earth of the sheet pile sections is reduced by the use of the method of the invention compared with the known method where the lower end portions of the locking channels are not sealed and the liquid is not used.

WHAT WE CLAIM IS:—

1. A method of assembling sheet piling in the earth from sheet pile sections each provided on each of opposite edges with a locking channel, comprising sealing a lower end portion of one of the first locking channels of a first of the sections, introducing said first section into the earth, feeding a liquid having a low internal friction and a high specific gravity into said one locking channel during the introduction of said first section into the earth, and introducing a second of the sections into the earth, one of the locking channels of said second section engaging with said one locking channel of said first section, the liquid being displaced from said one locking channel as the second channel is introduced into the earth.

2. A method according to claim 1, wherein a member is attached underneath the second section and is received in said one locking channel of the first section, the liquid being pressed sideways out of said one locking channel by a lower end of said member.

3. A method according to claim 1 or 2, wherein the liquid is flushed into said locking channel of the first section with the aid of a hose.

4. A method according to claim 1 or 2, wherein the liquid is fed into said locking channel of the first section from a hole in the earth.

5. A method according to any one of the preceding claims, wherein the liquid is a bentonite suspension.

6. A method according to claim 5, wherein the bentonite suspension contains a small amount of cement.

7. A method according to claim 1 and substantially as described herein with reference to and as illustrated in the accompanying drawings.

8. A sheet pile section having a locking channel along each of opposite edges, a lower end portion of one of the locking channels being sealed by a lower end plate and an upright side plate.

9. A sheet pile section according to claim 8, wherein the length of the upright side plate is in the range from 0.5 to 1.5 metres.

10. A sheet pile section according to claim 8 or 9, wherein the lower end plate and the upright side plate are made of thin sheet steel.

11. A sheet pile section according to any one of claims 8 to 10, wherein the other locking channel extends downwards and terminates at a distance from a lower edge of the section at least equal to the length of the upright side plate.

12. A sheet pile section as claimed in claim 8 and substantially as described herein with reference to and as illustrated in the accompanying drawings.



(11)

During the introduction of the sheet pile section 1 into the earth, a liquid having a low internal friction and a high specific gravity is fed into the locking channel 2 shown. The other locking channel of the sheet pile section 1, which is not provided with an end plate 3 or with a side plate 4, engages during the introduction of the sheet pile section 1 with the adjacent locking channel of the preceding sheet pile section which has already been introduced into the earth, the latter locking channel being of the same construction as the locking channel 2.

In the embodiment shown in the drawing, the liquid is first fed into a hole 5 which has been dug into the earth, from where the liquid runs into the locking channel 2.

Alternatively it is possible to flush the liquid through a hose into the locking channel 2.

The liquid used may be bentonite suspension, the stability of which, while maintaining its thixotropic properties, may be enhanced by adding a small amount of cement.

The liquid consistently keeps the locking channel 2 filled to approximately the level of the ground surface and prevents earth from penetrating into the locking channel 2.

During the introduction of the next sheet pile section, an elongate member having a length of a few centimetres, attached underneath the wall portion of the locking channel of said subsequent sheet pile section which interlocks with the sheet pile section 1 that has already been introduced into the earth, is received in the locking channel 2 and is a close fit therein. This member may be rigidly attached to this subsequent sheet pile section and presses the liquid sideways out of the locking channel 2 with its lower end.

The wall portion of the locking channel of the subsequent sheet pile section, which is intended to interlock with the locking channel 2, may be removed over a height from the underside which approximately corresponds to that of the upright side plate 4. Thus the wall portion of the locking channel of the subsequent sheet pile section extends downwards and terminates at a distance from the lower edge of the sheet pile section at least equal to the length of the upright side plate 4.

As an alternative, it is likewise possible to form said upright side plate 4 of a material which is deformed and compressed by the wall of the locking channel of the next sheet pile section during the introduction thereof.

Frictional resistance in the locking channels during the introduction into the earth of the sheet pile sections is reduced by the use of the method of the invention compared with the known method where the lower end portions of the locking channels are not sealed and the liquid is not used.

WHAT WE CLAIM IS:—

1. A method of assembling sheet piling in the earth from sheet pile sections each provided on each of opposite edges with a locking channel, comprising sealing a lower end portion of one of the first locking channels of a first of the sections, introducing said first section into the earth, feeding a liquid having a low internal friction and a high specific gravity into said one locking channel during the introduction of said first section into the earth, and introducing a second of the sections into the earth, one of the locking channels of said second section engaging with said one locking channel of said first section, the liquid being displaced from said one locking channel as the second channel is introduced into the earth.

2. A method according to claim 1, wherein a member is attached underneath the second section and is received in said one locking channel of the first section, the liquid being pressed sideways out of said one locking channel by a lower end of said member.

3. A method according to claim 1 or 2, wherein the liquid is flushed into said locking channel of the first section with the aid of a hose.

4. A method according to claim 1 or 2, wherein the liquid is fed into said locking channel of the first section from a hole in the earth.

5. A method according to any one of the preceding claims, wherein the liquid is a bentonite suspension.

6. A method according to claim 5, wherein the bentonite suspension contains a small amount of cement.

7. A method according to claim 1 and substantially as described herein with reference to and as illustrated in the accompanying drawings.

8. A sheet pile section having a locking channel along each of opposite edges, a lower end portion of one of the locking channels being sealed by a lower end plate and an upright side plate.

9. A sheet pile section according to claim 8, wherein the length of the upright side plate is in the range from 0.5 to 1.5 metres.

10. A sheet pile section according to claim 8 or 9, wherein the lower end plate and the upright side plate are made of thin sheet steel.

11. A sheet pile section according to any one of claims 8 to 10, wherein the other locking channel extends downwards and terminates at a distance from a lower edge of the section at least equal to the length of the upright side plate.

12. A sheet pile section as claimed in claim 8 and substantially as described herein with reference to and as illustrated in the accompanying drawings.



13. Sheet piling assembled by a method
as claimed in any one of claims 1 to 7.

14. Sheet piling assembled from sheet pile
sections as claimed in any of claims 8 to 12.

MARKS & CLERK,
Chartered Patent Agents,
Agents for the Applicant(s).

(2)

Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1972.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from
which copies may be obtained.