construction, a temporary steel cofferdam-type of structure is used to provide a dry working environment within the interior of the hollow column. However, use of a temporary cofferdam is costly. Therefore, what is needed is a method that eliminates the temporary cofferdam so as to drastically lower both cost and construction time. Further, if there is a precast factory on land to produce parts of the platform, with the platform thereafter assembled on top of the already fixed hollow column, improved mass production capabilities and speed of construction is possible.

SUMMARY

[0006a] According to a first aspect of the present invention, there is provided a construction method for fixing a foundation having a hollow column adapted to support a waterborne structure thereon to a seabed, including : driving a plurality of steel tubes into the seabed at an installation location for the hollow column, each of the steel tubes having a free length above sea level, lowering the hollow column down to the seabed so as to be supported on the steel tubes, the steel tubes arranged within the hollow column, injecting underwater concrete between the seabed and the hollow column bottom to form a concrete plug, dewatering the interior of the hollow column, cutting the steel tubes above a level of a pile cap to be formed or at a determined design level, modifying the pile head so as to be fitted with lapping steel bars integrated into a pile cap reinforcement cage, fixing the steel reinforcement of the pile cap, and injecting concrete to cast the pile cap and complete the foundation.

[0006b] According to a second aspect of the present invention, there is provided a method for fixing a foundation adapted to support waterborne structures such as an offshore marine platform, the foundation having one or more hollow columns for supporting the offshore platform thereon that are to be fixed to the seabed, including: driving a plurality of piles into the seabed to the founding level, lowering a hollow column down to the seabed so as to surround the piles, forming a reinforced concrete plug in the bottom of the hollow column, the hollow column serving as a cofferdam, dewatering the interior of the hollow column, fixing pile cap reinforcement, and casting concrete to form a pile cap for the upper ends of the piles.

[0006c] According to a third aspect of the present invention, there is provided a construction method for waterborne structures including offshore platforms supported by at least one hollow columns adapted to support a beam-and-slab platform deck as part of the offshore platform, including: fixing the hollow column to the seabed as recited in the first aspect, and continuing installation and construction of the offshore platform from the already fixed hollow columns.

[0007] An example embodiment is directed to a construction method for fixing a foundation for supporting waterborne structures such as an offshore platform to a seabed, the foundation having one or more hollow cylindrical columns that are to be fixed to the seabed, such as a seabed comprising a thick layer of soft marine deposits. In the method, a plurality of steel tubes are driven into the founding layer in the seabed at an installation location of the hollow column, the steel tubes having a given free length above sea level, and the hollow column is then lowered down to the seabed so that the steel tubes are within the hollow column. Underwater concrete is injected between the seabed and bottom of the hollow column so as to form a concrete plug. The interior of the hollow column is dewatered so as to be used as a cofferdam, and then the steel tubes are cut above a pile cap level or determined design level. Thereafter, concrete is injected to cast the pile cap so as to complete the foundation.

[0008] Another example embodiment is directed to a construction method for fixing a foundation for supporting waterborne structures such as an offshore platform to a seabed, the foundation having one or more hollow cylindrical columns that are to be fixed to the seabed. In the method, a plurality of steel tubes is driven into the founding layer in the seabed, and the hollow column is then lowered down to the seabed so as to surround the steel tubes. A reinforced concrete plug is then formed in the bottom of the hollow column, the hollow column configured as a cofferdam. The interior of the hollow column is then dewatered, pile cap reinforcement is fixed, and then concrete is cast to form a pile cap.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The example embodiment will become more fully understood from the detailed description given herein below and the accompanying drawings, wherein like elements are represented by like reference numerals, which are given by way of illustration only and thus are not limitative of the example embodiments herein.