on the generally-known relationship between pressure and consolidation settlement amount and therefore cannot achieve further volume reduction. For this reason, there has been a demand for a different method to achieve significant volume reduction which has been desired today.

[0004]

As another volume reduction method, a fill surcharge method has been known in which fill is placed on top of target soil to reduce its volume. In this method, however, since the soil is consolidated by the load from the fill, it is difficult to significantly reduce the volume of the target soil.

PRIOR ART DOCUMENT

PATENT DOCUMENT

[0005]

Patent Document 1: Japanese patent application Kokai publication No. 2009-167707

SUMMARY OF THE INVENTION

PROBLEM TO BE SOLVED BY THE INVENTION

[0006]

An object of the present invention is to provide a soil-volume reduction method capable of significantly reducing the volume of soil in comparison to conventional methods.

MEANS FOR SOLVING THE PROBLEM

[0007]

To achieve the above object, according to a first aspect of the present invention, a soil-volume reduction method of the present invention is characterized in that the soil-volume reduction method includes: agitating target soil to a prescribed depth in a prescribed range to thereby form a disturbed region in the target soil, 30% to 80% inclusive of

the volume of the target soil being formed into the disturbed region; and then installing a drain in the target soil and discharging water in the target soil out

of the target soil through the drain to thereby increase an amount of consolidation of the target soil and thus reduce a volume thereof.

[0007a]

According to a third aspect of the present invention, a soil-volume reduction method is characterized in that the soil-volume reduction method comprises: agitating target soil to a prescribed depth in a prescribed range to thereby form a disturbed region in the target soil, 50% or more of the volume of the target soil being formed into the disturbed region; and then installing a drain in the target soil and discharging water in the target soil out of the target soil through the drain to thereby increase an amount of consolidation of the target soil and thus reduce a volume thereof.

[0008]

Here, a drain method performed under atmospheric pressure can be used for the discharge of the water in the target soil out of the target soil through the drain. Alternatively, a vacuum consolidation method performed under a negative pressure can be used. Also, a downward load can be applied to the target soil after the discharge of the water in the target soil out of the target soil through the drain. For example, the downward load is applied by placing dirt on the target soil in which the disturbed region is formed. To form the disturbed region, an agitating blade of a soil improving apparatus is rotated in the target soil, for example. For example, 30% to 80% inclusive of the volume of the target soil is formed into the disturbed region. Alternatively, 50% or more of the volume of the target soil is formed into the disturbed region.

EFFECTS OF THE INVENTION

[0009]

According to the present invention, as the initial step, the disturbed region is formed in the target soil to thereby artificially destruct the structure between clay particles in the soil and significantly reduce the durability (resistance) thereof against external force (load). Then, the drain is installed in the target soil and the water in the target soil is discharged out of the target soil through the drain. Thus, it is possible to achieve a higher level of volume reduction effect, rather than an extension of the volume reduction effect based on the generally-known relationship between pressure and