arrangement needs to be performed in the state of holding main reinforcing bars 11 using a crane in order to prevent the main reinforcing bars 11 from collapsing, and thus the efficiency of use of the crane is decreased. Furthermore, the cross tie reinforcing bars 13 make the placement of concrete difficult due interference with concrete aggregates.

SUMMARY

The present invention has been developed to overcome the problem in which a conventional solid reinforced concrete column is difficult to construct due to interference with the arrangement of cross tie reinforcing bars, and an object of the present invention is to provide a solid reinforced concrete column having a new reinforcing bar arrangement structure, which enables cross tie reinforcing bars, traversing the sections of the column, to be omitted or reduced.

Another object of the present invention is to provide a method of constructing a solid reinforced concrete column, which can improve the efficiency of construction and shorten the period of construction through the modularization of the arrangement of reinforcing bars.

Herein disclosed is a solid reinforced concrete column,

including: outer main reinforcing bars arranged in the axial direction of the solid reinforced concrete column; inner reinforcing bars each arranged to be placed between two or three of the outer main reinforcing bars inside the two or three outer main reinforcing bars in the axial direction; inner transverse reinforcing bars each arranged to connect the two or three outer main reinforcing bars and the inner reinforcing bar, placed between the two or three outer main reinforcing bars, in the transverse direction of the solid reinforced concrete column, thereby forming each triangular reinforcing bar network; outer transverse reinforcing bars arranged to surround the outer main reinforcing bars outside the outer main reinforcing bars in the transverse direction; and concrete placed to bury the outer main reinforcing bars, the inner reinforcing bars, the inner transverse reinforcing bars, and the outer transverse reinforcing bars.

Further disclosed is a method of constructing a solid reinforced concrete column, including: a first step of assembling each triangular reinforcing bar network by connecting two or three outer main reinforcing bars and a single inner reinforcing bar by inner transverse reinforcing bars; a second step of arranging reinforcing bars by arranging a plurality of triangular reinforcing bar networks and then surrounding the outside of the plurality of triangular

reinforcing bar networks with outer transverse reinforcing bars; and a third step of placing concrete so that the reinforcing bars arranged at the second step are buried in the concrete.

In accordance with a first aspect of the present invention, there is provided a solid reinforced concrete column, comprising: outer main reinforcing bars arranged in an axial direction of the solid reinforced concrete column; inner reinforcing bars arranged in the axial direction and located interior of the outer main reinforcing bars; inner transverse reinforcing bars each connecting two or three outer main reinforcing bars and a single one of the inner reinforcing bars, which is placed adjacent to the two or three outer main reinforcing bars, in a transverse direction of the solid reinforced concrete column, thereby forming a plurality of triangular reinforcing bar networks; outer transverse reinforcing bars surrounding the outer main reinforcing bars outside the outer main reinforcing bars in the transverse direction; and concrete burying the outer main reinforcing bars, the inner reinforcing bars, the inner transverse reinforcing bars, and the outer transverse reinforcing bars, wherein, when taken from a sectional view of the solid reinforced concrete column taken by a cutting plane perpendicular to the axial direction, an area interior of the outer transverse reinforcing bars is entirely filled with the

concrete, wherein the inner reinforcing bars are securely connected to the inner transverse reinforcing bars, such that the inner reinforcing bars are not connected to the outer transverse reinforcing bars.

In accordance with a second aspect of the present invention, there is provided a method of constructing the solid reinforced concrete column of the first aspect, comprising: a first step of assembling each triangular reinforcing bar network by connecting the two or three outer main reinforcing bars and the single one of the inner reinforcing bars by each of the inner transverse reinforcing bars; then a second step of arranging the plurality of triangular reinforcing bar networks and then surrounding an outside of the plurality of triangular reinforcing bar networks with the outer transverse reinforcing bars; and then a third step of placing the concrete such that the outer main reinforcing bars, the inner reinforcing bars, the inner transverse reinforcing bars, and the outer transverse reinforcing bars are buried by the concrete, and forming a solid column of the concrete.

In accordance with a third aspect of the present invention, there is provided a method of constructing the solid reinforced concrete column of the first aspect, comprising: a first step of assembling each triangular reinforcing bar network by connecting the two or three outer

main reinforcing bars and the single one of the inner reinforcing bars by each of the inner transverse reinforcing bars, wherein the inner reinforcing bars are designed as column main reinforcing bars; then a second step of arranging the plurality of triangular reinforcing bar networks and then surrounding an outside of the plurality of triangular reinforcing bar networks with the outer transverse reinforcing bars; and then a third step of placing the concrete such that the outer main reinforcing bars, the inner reinforcing bars, the inner transverse reinforcing bars, and the outer transverse reinforcing bars are buried by the concrete, and forming a solid column of the concrete.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a sectional view of a conventional solid reinforced concrete column;

FIG. 2 is a sectional view of a solid reinforced concrete column according to the present invention;

FIG. 3 shows various embodiments of the arrangement details of triangular reinforcing bar networks in a solid

reinforced concrete column according to the present invention;

FIG. 4 is a flowchart of a method of constructing a solid reinforced concrete column according to the present invention;

FIG. 5 shows the state of the assembly of a triangular reinforcing bar network using a jig in a method of constructing a solid reinforced concrete column according to the present invention;

FIG. 6 shows various embodiments of a method of

WHAT IS CLAIMED IS:

1. A solid reinforced concrete column, comprising:

outer main reinforcing bars arranged in an axial direction of the solid reinforced concrete column;

inner reinforcing bars arranged in the axial direction and located interior of the outer main reinforcing bars;

inner transverse reinforcing bars each connecting two or three outer main reinforcing bars and a single one of the inner reinforcing bars, which is placed adjacent to the two or three outer main reinforcing bars, in a transverse direction of the solid reinforced concrete column, thereby forming a plurality of triangular reinforcing bar networks;

outer transverse reinforcing bars surrounding the outer main reinforcing bars outside the outer main reinforcing bars in the transverse direction; and

concrete burying the outer main reinforcing bars, the inner reinforcing bars, the inner transverse reinforcing bars, and the outer transverse reinforcing bars,

wherein, when taken from a sectional view of the solid reinforced concrete column taken by a cutting plane perpendicular to the axial direction, an area interior of the outer transverse reinforcing bars is entirely filled with the concrete,

wherein the inner reinforcing bars are securely connected to the inner transverse reinforcing bars, such that the inner reinforcing bars are not connected to the outer transverse reinforcing bars.

2. The solid reinforced concrete column of claim 1, wherein the inner reinforcing bars are designed as column main reinforcing bars.

3. The solid reinforced concrete column of claim 1, wherein the single one of the inner reinforcing bars includes an inner side which faces a center of the concrete column and an outer side opposite to the inner side, the inner side being connected to and in contact with a corresponding one of the inner transverse reinforcing bars, the outer side being surrounded by the concrete without being connected to another transverse reinforcing bar.

4. A method of constructing the solid reinforced concrete column of claim 1, comprising:

a first step of assembling each triangular reinforcing bar network by connecting the two or three outer main reinforcing bars and the single one of the inner reinforcing bars by each of the inner transverse reinforcing bars; then

a second step of arranging the plurality of triangular

reinforcing bar networks and then surrounding an outside of the plurality of triangular reinforcing bar networks with the outer transverse reinforcing bars; and then

a third step of placing the concrete such that the outer main reinforcing bars, the inner reinforcing bars, the inner transverse reinforcing bars, and the outer transverse reinforcing bars are buried by the concrete, and forming a solid column of the concrete.

5. The method of claim 4, wherein the first step is performed by connecting the inner transverse reinforcing bars in a state in which the two or three outer main reinforcing bars and the single one of the inner reinforcing bars are fastened to a pair of jigs.

6. The method of claim 4, wherein the second step is performed by installing the plurality of triangular reinforcing bar networks at a location of the column, and then surrounding the plurality of triangular reinforcing bar networks with the outer transverse reinforcing bars.

7. The method of claim 4, wherein, in the second step, all of the plurality of triangular reinforcing bar networks are surrounded with the outer transverse reinforcing bars, forming a column reinforcing bar network, and then the column

reinforcing bar network is lifted by a crane and relocated at a target location at which the solid reinforced concrete column is to be located.

8. The method of claim 4, wherein, in the second step, a predetermined number of the plurality of triangular reinforcing bar networks are simultaneously hung on a dedicated jig and lifted by a crane and placed at a target location at which the solid concrete column is to be located, and, when all of the plurality of triangular reinforcing bar networks are placed at the target location, the plurality of triangular reinforcing bar networks are surrounded with the outer transverse reinforcing bars.

9. The method of claim 4, wherein the second step is performed by burying a guide plate, in which reinforcing bar receiving holes are formed, in an upper portion of a base part, and then installing the triangular reinforcing bar networks in such a way as to insert the outer main reinforcing bars or inner reinforcing bars into the reinforcing bar receiving holes of the guide plate.

10. The method of claim 4, wherein the single one of the inner reinforcing bars includes an inner side which faces a center of the concrete column and an outer side opposite to

the inner side, and

wherein the inner side is connected to and in contact with a corresponding one of the inner transverse reinforcing bars, and the outer side is surrounded by the concrete without being connected to another transverse reinforcing bar.

11. A method of constructing the solid reinforced concrete column of claim 2, comprising:

a first step of assembling each triangular reinforcing bar network by connecting the two or three outer main reinforcing bars and the single one of the inner reinforcing bars by each of the inner transverse reinforcing bars; then

a second step of arranging the plurality of triangular reinforcing bar networks and then surrounding an outside of the plurality of triangular reinforcing bar networks with the outer transverse reinforcing bars; and then

a third step of placing the concrete such that the outer main reinforcing bars, the inner reinforcing bars, the inner transverse reinforcing bars, and the outer transverse reinforcing bars are buried by the concrete, and forming a solid column of the concrete.

12. The method of claim 11, wherein the first step is performed by connecting the inner transverse reinforcing bars in a state in which the two or three outer main reinforcing

bars and the single one of the inner reinforcing bars are fastened to a pair of jigs.

13. The method of claim 11, wherein the second step is performed by installing the plurality of triangular reinforcing bar networks at a location of the column, and then surrounding the plurality of triangular reinforcing bar networks with the outer transverse reinforcing bars.

14. The method of claim 11, wherein, in the second step, all of the plurality of triangular reinforcing bar networks are surrounded with the outer transverse reinforcing bars, forming a column reinforcing bar network, and then the column reinforcing bar network is lifted by a crane and relocated at a target location at which the solid reinforced concrete column is to be located.

15. The method of claim 11, wherein, in the second step, a predetermined number of the plurality of triangular reinforcing bar networks are simultaneously hung on a dedicated jig and lifted by a crane and placed at a target location at which the solid concrete column is to be located, and, when all of the plurality of triangular reinforcing bar networks are placed at the target location, the plurality of triangular reinforcing bar networks are surrounded with the

outer transverse reinforcing bars.

16. The method of claim 11, wherein the second step is performed by burying a guide plate, in which reinforcing bar receiving holes are formed, in an upper portion of a base part, and then installing the triangular reinforcing bar networks in such a way as to insert the outer main reinforcing bars or inner reinforcing bars into the reinforcing bar receiving holes of the guide plate.