

DESCRIPTION

BUILDING CONSTRUCTION METHOD

Technical Field

[0001] The present disclosure relates to a building construction method.

Background Art

[0002] Japanese Patent Application Laid-Open (JP-A) No. 2017-172262 discloses a construction method for a building in which an elevator shaft is constructed first, before constructing a skeleton peripherally to the elevator shaft.

SUMMARY OF INVENTION

Technical Problem

[0003] In the building construction method described in JP-A No. 2017-172262, the elevator shaft is constructed first, after which the skeleton is constructed sequentially from the bottom upward. The construction project might therefore take longer than would be the case were the elevator shaft not constructed first. In particular, when constructing a building including basement levels, it is necessary to excavate the ground before constructing the elevator shaft, causing the construction project to take even longer.

[0004] The present disclosure provides a building construction method capable of shortening the length of time taken by a construction project when constructing a building that has a core structure and includes basement levels.

Solution to Problem

[0005] A building construction method of a first aspect includes , constructing a foundation on an excavation face that is formed by excavating the ground, installing, on the foundation, a plurality of columns configuring one portion of a below-ground core section constructing, on the columns, a wall-shaped above-ground core section that is coupled to tops of the columns, constructing an above-ground skeleton peripheral to the above-ground core section, while the above-ground core section is being constructed, and while the above-ground core section is being constructed, constructing a below-ground skeleton peripheral to the columns and constructing another portion of the below-ground core section, wherein the below-ground core section is constructed in a wall shape by constructing the other portion of the below-ground core section sequentially from bottom upward.

[0006] In the building construction method of the first aspect, first, the plural columns configuring the one portion of the below-ground core section are installed on the foundation. Next, the above-ground core section is constructed, with the columns acting as a support

structure. The above-ground skeleton, the other portion of the below-ground core section, and the below-ground skeleton are then constructed while the above-ground core section is being constructed. Namely, in the building that has a core structure and includes basement levels, the above-ground skeleton and the below-ground skeleton can be constructed at the same time as each other. This enables the length of time taken to construct the building to be reduced in comparison to cases in which the below-ground skeleton and the above-ground skeleton are constructed in consecutive stages, with construction of the above-ground skeleton following construction of the below-ground skeleton.

[0007] The columns that support the above-ground core section configure the one portion of the below-ground core section. Namely, the columns can be utilized as permanent installation members. This enables the number of removal processes to be reduced in comparison to cases in which the columns are configured by temporary members.

[0008] Moreover, construction of the below-ground core section is split between construction of the columns and construction of the other portion. This enables struts that pass between the columns in order to hold back retaining walls of the excavation face to be left in place until construction of the other portion. This enables a reduction in tasks to reposition and reassemble the struts. Moreover, a narrower horizontal pitch of the struts can be achieved than in cases in which the struts are installed so as to avoid the entire below-ground core section. This enables the reinforcement requirements of the struts and waling members to be reduced.

[0009] A building construction method of a second aspect is the building construction method of the first aspect, wherein the columns are formed using precast concrete, and the below-ground core section is formed by casting concrete between neighboring columns.

[0010] According to the building construction method of the second aspect, the columns are formed using precast concrete. This enables the columns to be erected faster than in cases in which the columns are formed using concrete cast in-situ. This enables the advantageous effect of shortening the length of time taken by the construction project to be further enhanced.

[0011] A building construction method of a third aspect is the building construction method of either the first aspect or the second aspect, wherein additional installation of the columns is performed while the above-ground core section is being constructed.

[0012] According to the building construction method of the third aspect, additional installation of the columns is performed as the weight of the above-ground core section increases accompanying construction of the above-ground core section. This enables building of the above-ground core section to be started at a stage at which the number of

columns already constructed is fewer than the number of columns that will ultimately be required. Namely, this enables building of the above-ground core section to be started earlier. This enables the advantageous effect of shortening the length of time taken by the construction project to be further enhanced.

Advantageous Effects of Invention

[0013] The present disclosure enables the length of time taken by a construction project to be shortened when constructing a building that has a core structure and includes basement levels.

BRIEF DESCRIPTION OF DRAWINGS

[0014] Fig. 1A is a vertical cross-section illustrating a building constructed using a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 1B is a cross-section sectioned along line B-B in Fig. 1A.

Fig. 2A is a vertical cross-section illustrating a state in which ground has been excavated and retaining walls have been formed in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 2B is a cross-section sectioned along line B-B in Fig. 2A.

Fig. 3A is a vertical cross-section illustrating a state in which columns have been installed on a foundation deck in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 3B is a cross-section sectioned along line B-B in Fig. 3A.

Fig. 4A is a vertical cross-section illustrating a state in which an above-ground core section has been constructed on the columns and a below-ground skeleton has been constructed peripherally to the columns in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 4B is a cross-section sectioned along line B-B in Fig. 4A.

Fig. 5A is a vertical cross-section illustrating a state in which cast sections are being formed between the columns and a below-ground core section is being constructed sequentially from the bottom upward in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 5B is a vertical cross-section illustrating a state in which an additional column has been installed in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 6A is a plan view illustrating a modified example in which an L-shaped column is formed in a building construction method according to an exemplary embodiment of the

present disclosure.

Fig. 6B is a plan view illustrating a modified example in which columns are formed thinner than the thickness of a below-ground core section in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 6C is a plan view illustrating a modified example in which columns are formed using H-section steel beams in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 7 is a vertical cross-section illustrating a modified example in which levels closer to ground level are constructed before levels closer to a foundation deck in a below-ground skeleton in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 8A is a vertical cross-section illustrating a modified example in which slabs of a ground level floor are constructed before a below-ground skeleton in a building construction method according to an exemplary embodiment of the present disclosure.

Fig. 8B is a cross-section sectioned along line B-B in Fig. 8A.

DESCRIPTION OF EMBODIMENTS

[0015] Explanation follows regarding a construction method for a building according to an exemplary embodiment of the present disclosure, with reference to the drawings. Configuration elements indicated by the same reference numerals in each of the drawings are understood to be the same configuration elements. Unless specifically stated otherwise, the respective configuration elements described in the current specification are not limited to being singular configuration elements, and plural of such configuration elements may be present. Explanation regarding configurations and reference numerals appearing repeatedly in the respective drawings may be omitted. Note that the present disclosure is not limited to the exemplary embodiment described below, and various modifications, including the omission of certain configurations or substitution for alternative configurations, may be implemented within a range not departing from the spirit of the present disclosure.

[0016] Building

As illustrated in Fig. 1A and Fig. 1B, a building 10 applied with a building construction method according to an exemplary embodiment of the present disclosure is, as an example, a building with a reinforced-concrete structure (RC structure) in which a central core approach is adopted.

[0017] A "central core approach" is a structural approach in which a tubular skeleton (namely a core) extending in a vertical direction is formed at a central portion of the building.

Seismic protection elements such as earthquake-resistant walls and earthquake-resistant braces, stairwells, elevator shafts, service pipes and ducts, and the like are located in the core section. Outer peripheral sections supported by the core section are constructed peripherally to the core section.

[0018] An outer peripheral section 30 is constructed peripherally to a core section 20 of the building 10. The core section 20 is configured by an RC structure skeleton, and is configured including a below-ground core section 22 and an above-ground core section 24. The below-ground core section 22 and the above-ground core section 24 have the same profile as each other in plan view. The below-ground core section 22 and the above-ground core section 24 are formed integrally to one another.

[0019] Note that although not illustrated in Fig. 1A and Fig. 1B, partitioning walls are constructed within the core section 20 in order to partition between the stairwells, elevator shafts, service pipes and ducts, and the like mentioned above. Slabs, on which occupants of the building 10 can walk and objects can be placed, are also constructed within the core section 20. Openings are formed as appropriate in concrete walls of the core section 20 in order to allow occupants of the building 10 to come and go between the inside and the outside of the core section 20.

[0020] As an example, the outer peripheral section 30 is configured including beams 32 supported by the core section 20 so as to jut out from the core section 20, slabs 34 supported by the beams 32, and external walls 36 supported by the slabs 34.

[0021] Note that non-illustrated joists may span between the beams 32. Alternatively, the thickness of the slabs 34 may be adjusted so as to allow omission of the beams 32. Columns and walls may be constructed as appropriate between vertically adjacent beams 32 or slabs 34.

[0022] The external walls 36 are, as an example, formed by curtain walls. These curtain walls are formed by alternately disposing sheet-shaped panel sections formed from ALC sheeting, steel sheeting, or the like, and window sections formed from plate glass, along the vertical direction (detailed explanation of this configuration is omitted). Note that the panel sections and the window sections of the external walls 36 may be arranged as desired, and, for example, the curtain wall may be configured entirely by plate glass window sections.

[0023] The external walls 36 are external walls employed for the above-ground portion of the building 10. External walls of the below-ground portion of the building 10 are formed by retaining walls 40. In other words, the retaining walls 40 double as external walls of the below-ground portion of the building 10.

[0024] In the following explanation, the beams 32, the slabs 34, the external walls 36, and other structural members configuring the above-ground portion of the outer peripheral section

30 are collectively referred to as the above-ground skeleton. Meanwhile, the beams 32, the slabs 34, and other structural members configuring the below-ground portion of the outer peripheral section 30 are collectively referred to as the below-ground skeleton 30B.

[0025] Building Construction Method

Explanation follows regarding a construction method of the building 10, with reference to Fig. 2A to Fig. 5B.

[0026] Ground Excavation

In order to construct the building 10, first, as illustrated in Fig. 2A, the retaining walls 40 are formed within the ground G, and the ground G is excavated. A foundation deck 12 serving as a pressure-withstanding plate is constructed on the excavation bottom (excavation face GA). The thickness of the foundation deck 12 is determined as appropriate according to characteristics of the ground G, such as the groundwater pressure. Note that the foundation deck 12 may be configured by a mat slab, or may be configured by a combination of a deck and grade beams.

[0027] Plural struts 42 are installed spanning between mutually opposing retaining walls 40 as the ground G is excavated. Waling members (not illustrated in the drawings) are disposed as appropriate between the retaining walls 40 and the struts 42 to avoid local concentrations of reaction force from the struts 42.

[0028] As illustrated in Fig. 2A, plural of the struts 42 are arranged in the vertical direction. Moreover, as illustrated in Fig. 2B, plural of the struts 42 are arranged in directions (an X direction and a Y direction) so as to oppose the retaining walls 40 on each side, the retaining walls 40 being formed in a rectangular frame shape in plan view.

[0029] Note that the intervals between the struts 42 are set as appropriate according to the span between the mutually opposing retaining walls 40, as well as the excavation depth, water pressure, and the like of the ground G.

[0030] Column Installation

Next, as illustrated in Fig. 3A and Fig. 3B, plural columns 22A configuring one portion of the below-ground core section 22 are installed on the foundation deck 12. The columns 22A are wall-type columns (in other words, columns formed in rectangular wall shapes and having a flattened profile) and form the one portion of the below-ground core section 22. The columns 22A are formed from precast concrete, and are fixed to the foundation deck 12 using anchor bolts or the like.

[0031] Each of the columns 22A may be formed in one piece in a factory to a length that will span from an upper face of the foundation deck 12 to ground level GL, or may be formed in segments. In cases in which the columns 22A are formed in segments, the columns 22A

are built by joining segmented members together at the construction site. Since the columns 22A are built before the below-ground skeleton 30B (see Fig. 1A), the columns 22A cannot be fixed to the below-ground skeleton 30B. Accordingly, wire supports WS or the like are preferably employed as appropriate in order to prevent the columns 22A from swaying or toppling over.

[0032] As illustrated in Fig. 3B, the columns 22A are disposed discretely to one another. Moreover, the columns 22A are disposed at positions that will later form the below-ground core section 22, illustrated by dashed lines in Fig. 3B. Moreover, a thickness d1 (X direction thickness) and a thickness d2 (Y direction thickness) of the respective columns 22A substantially correspond to the thickness of the below-ground core section 22.

[0033] The columns 22A are disposed between neighboring struts 42. In other words, the struts 42 are disposed out of the way of the positions of the columns 22A, these being constructed after placement of the struts 42. To put this in yet another way, the struts 42 are disposed between the neighboring columns 22A that will go on to form the below-ground core section 22.

[0034] Above-Ground Core Section Construction

Next, as illustrated in Fig. 4A and Fig. 4B, the tops of the columns 22A are coupled together, and the wall shaped above-ground core section 24 is constructed on the columns 22A. As an example, the above-ground core section 24 is constructed using a slip forming construction technique. In a slip forming construction technique, a concrete skeleton is constructed sequentially from the bottom upward by casting concrete continuously into a form that is capable of sliding in the vertical direction. Note that the above-ground core section 24 is formed above at least the uppermost struts 42.

[0035] In the above-ground core section 24, non-illustrated reinforcing steel is embedded in the first portion to be built, namely an internal portion of a coupling section 24A that couples the tops of the columns 22A together. This reinforcing steel is embedded in order to support the load of the above-ground core section 24. The coupling section 24A illustrated in Fig. 4B has substantially the same plan view profile as the plan view profile of the below-ground core section 22 that will be constructed later (see Fig. 3B).

[0036] As illustrated in Fig. 5A, layered sections 24B are constructed above the coupling section 24A. Each of the layered sections 24B is, for example, formed by casting concrete equivalent in height to three stories of the building 10 in a single operation.

[0037] An above-ground skeleton 30A is constructed peripherally to the above-ground core section 24 while the layered sections 24B are being constructed, namely while the above-ground core section 24 is being constructed. As described above, the above-ground

skeleton 30A is configured including at least one element out of the beams 32 and the slabs 34. The above-ground skeleton 30A may also include other structural members (for example columns and partitioning walls).

[0038] Note that the above-ground core section 24 is preferably joined to the beams 32 or the slabs 34 using post-installed anchors.

[0039] Construction of Below-Ground Skeleton

As illustrated in Fig. 4A, the below-ground skeleton 30B is constructed peripherally to the columns 22A while the above-ground core section 24 is being constructed. As described above, the below-ground skeleton 30B is configured including at least one element out of the beams 32 and the slabs 34. The below-ground skeleton 30B may also include other structural members (for example columns and partitioning walls 38).

[0040] Note that "while the above-ground core section 24 is being constructed" encompasses embodiments where this implies "while the coupling section 24A of the above-ground core section 24 is being constructed", embodiments where this implies "after the coupling section 24A has been constructed but before the layered section 24B is constructed", and also embodiments where this implies "after the coupling section 24A has been constructed and while the layered section 24B is being constructed".

[0041] Construction of Below-Ground Core Section

Concrete is cast (as cast sections 22B) between the neighboring columns 22A concurrently to construction of the below-ground skeleton 30B. The concrete is cast sequentially from the bottom upward. Namely, concrete is cast sequentially from the bottom upward between the columns 22A, configuring "one portion" of the below-ground core section 22, to form the cast sections 22B, configuring "another portion" of the below-ground core section 22. Note that the wall-shaped below-ground core section 22 is constructed sequentially from the bottom upward.

[0042] Strut Removal

The struts 42 are removed concurrently to construction of the below-ground skeleton 30B and formation of the cast sections 22B. Constructing the below-ground skeleton 30B and forming the cast sections 22B allows the pressure of the earth acting on the retaining walls 40 from the ground G to be shifted from the struts 42 to the below-ground skeleton 30B and the below-ground core section 22. This enables deformation of the retaining walls 40 as a result of removal of the struts 42 to be suppressed.

[0043] An example of a method for forming the cast sections 22B is a method in which the cast sections 22B are formed "at the same time" as portions of the below-ground core section 22 other than portions where the columns 22A are constructed. Note that the height that can

be formed in a single operation is a height equivalent to one or two stories of the building 10, as illustrated in the example in Fig. 5A. In such cases, the struts 42 are removed prior to casting the concrete to form the cast sections 22B.

[0044] Another example of a method for forming the cast sections 22B is a method in which the cast sections 22B are formed "sequentially" to portions of the below-ground core section 22 other than portions where the columns 22A are constructed. In such cases, the struts 42 are removed in plural phases, and the cast sections 22B are formed at locations from which the struts 42 have been removed. For example, the strut 42A illustrated in Fig. 3B is removed first before forming a cast section 22B at a location that was previously crossed by the strut 42A. Next, the strut 42B is removed, and a cast section 22B is formed at a location that was previously crossed by the strut 42B.

[0045] In this manner, the order of "construction of the below-ground skeleton 30B", "formation of the cast sections 22B", and "removal of the struts 42" may be set as appropriate in consideration of the pressure of the earth acting on the struts 42 from the retaining walls 40.

[0046] Additional Column Installation

As described above, in the construction method of the building 10 according to the present exemplary embodiment, the below-ground skeleton 30B is constructed while the above-ground core section 24 is being constructed (see Fig. 4A and Fig. 5A). The wall-shaped below-ground core section 22 is constructed sequentially from the bottom upward concurrently with construction of the below-ground skeleton 30B (see Fig. 5A).

[0047] Note that as illustrated in Fig. 5B, as construction of the above-ground core section 24 progresses, the weight of the above-ground core section 24 and the above-ground skeleton 30A increases, thus increasing the load acting on the columns 22A. However, as illustrated in Fig. 5A, during the period in which the below-ground core section 22 is being sequentially constructed from the bottom upward, gaps are present between the cast sections 22B and the coupling section 24A. While such gaps are present, it is difficult for the cast sections 22B to support the load of the above-ground core section 24. It is therefore difficult to obtain high support strength from the below-ground core section 22 that functions as a "column" to support the weight of the above-ground core section 24 and the above-ground skeleton 30A.

[0048] In order to support this weight, additional column installation may be performed while the above-ground core section 24 is being constructed. Specifically, as illustrated in Fig. 5B, a column 22C spanning from the upper face of the foundation deck 12 to the lower face of the coupling section 24A of the above-ground core section 24 is additionally installed between the neighboring columns 22A.

[0049] The column 22C may be formed so as to fill the space between neighboring columns

22A, as illustrated in Fig. 5B. In such cases, the column 22C and the columns 22A are integrated into a wall-column. Alternatively, the column 22C may be formed with gaps present between itself and the neighboring columns 22A.

[0050] Operation

In the building construction method according to the present exemplary embodiment, as illustrated in Fig. 3A, first, plural of the columns 22A are installed on the foundation deck 12 so as to configure the one portion of the below-ground core section 22. Next, as illustrated in Fig. 4A and Fig. 5A, the above-ground core section 24 is constructed with the columns 22A acting as a support structure. The above-ground skeleton 30A, another portion (the cast sections 22B) of the below-ground core section 22, and the below-ground skeleton 30B are then constructed while the above-ground core section 24 is being constructed. Namely, in the building 10 that has a core structure and includes basement levels, the above-ground skeleton 30A and the below-ground skeleton 30B can be constructed at the same time as each other. This enables the length of time taken to construct the building 10 to be reduced in comparison to cases in which the below-ground framework 30B and the above-ground skeleton 30A are constructed in consecutive stages, with construction of the above-ground framework 30A following construction of the below-ground skeleton 30B.

[0051] Moreover, the columns 22A that support the above-ground core section 24 configure the one portion of the below-ground core section 22. Namely, the columns 22A can be utilized as permanent installation members. This enables the number of removal processes to be reduced in comparison to cases in which the columns 22A are configured by temporary members.

[0052] Moreover, construction of the below-ground core section 22 is split between construction of the columns 22A and construction of the other portion of the below-ground core section 22 (namely the cast sections 22B). This enables the struts 42 that hold back the retaining walls 40 to be left in place between the columns 22A until construction of the cast sections 22B. This enables a reduction in tasks to reposition and reassemble the struts 42. Moreover, a narrower horizontal pitch of the struts 42 can be achieved than in cases in which the struts 42 are installed so as to avoid the entire below-ground core section 22. This enables the reinforcement requirements of the struts 42 and the waling to be reduced.

[0053] Moreover, in the building construction method according to the present exemplary embodiment, the columns 22A are formed using precast concrete. This enables the columns 22A to be erected faster than in cases in which the columns 22A are formed using concrete cast in-situ. This enables the length of time taken by the construction project to be shortened.

[0054] Moreover, in the building construction method according to the present exemplary embodiment, as illustrated in Fig. 5B, the column 22C is additionally installed as the weight of the above-ground core section 24 increases accompanying construction of the above-ground core section 24. This enables building of the above-ground core section 24 to be started at a stage at which the number of columns already constructed is fewer than the number of columns that will ultimately be required to support the weight of the above-ground core section 24. Namely, this enables building of the above-ground core section 24 to be started earlier. This thereby enables the length of time taken by the construction project to be shortened.

[0055] Other Exemplary Embodiments

In the present exemplary embodiment, as illustrated in Fig. 3B the columns 22A are configured by flattened columns formed in rectangular wall shapes. However, the present disclosure is not limited to such an exemplary embodiment.

[0056] For example, as in the case of columns 22D illustrated in Fig. 6A, the columns may be configured with substantially L-shaped profiles (in other words, angled profiles) so as to form corners of the below-ground core section 22. The columns 22D formed in this manner are more readily free-standing than the columns 22A, enabling the configuration of wire supports to be simplified.

[0057] Moreover, in the present exemplary embodiment, thicknesses d1 (thickness of the columns 22A in the X direction) and d2 (thickness of the columns 22A in the Y direction) of the columns 22A substantially match the respective thicknesses of the below-ground core section 22. However, exemplary embodiments of the present disclosure are not limited thereto.

[0058] For example, as in the case of columns 22E illustrated in Fig. 6B, the thickness of the columns may be thinner than the thickness of the below-ground core section 22. This reduces the weight per column, making the columns easier to transport and put in place.

[0059] Moreover, as in the case of columns 22F illustrated in Fig. 6C, the columns may be formed from steel reinforcement members such as H-section steel beams, rectangular steel tubes, or the like. Employing such steel reinforcement members enables easier joining to the foundation deck 12 and the coupling section 24A of the above-ground core section 24, using anchor bolts, studs, and the like.

[0060] Alternatively, the columns may be formed by concrete cast in-situ. Employing concrete cast in-situ enables a reduction in transportation operations from the factory and crane lifting operations.

[0061] Although the building 10 to which the building construction method according to the

present exemplary embodiment is applied is a building with a central core, exemplary embodiments of the present disclosure are not limited thereto. For example, the building 10 may be building with cores at either end or a building with an eccentric core. The method described in the present disclosure may also be applied when such core formation methods are employed.

[0062] Although the external walls of the below-ground portion of the building 10 are configured by the retaining walls 40, exemplary embodiments of the present disclosure are not limited thereto. For example, external walls of the below-ground portion of the building 10 may be constructed separately and disposed discretely to the retaining walls 40. In such cases, earth anchors or the like are preferably employed to reinforce the retaining walls.

[0063] Moreover, in the present exemplary embodiment, as illustrated in Fig. 4A and Fig. 5B, the below-ground skeleton 30B is constructed in sequence from levels closest to the foundation deck 12 (namely from lower levels toward upper levels). However, exemplary embodiments of the present disclosure are not limited thereto. For example, as illustrated in Fig. 7, levels closer to ground level (for example an uppermost basement level) may be constructed before constructing levels closer to the foundation deck 12 (for example the sub-basement level illustrated by double-dotted dashed lines in Fig. 7).

[0064] Alternatively, as illustrated in Fig. 8A, the slabs 34 of a ground level floor may be constructed, followed by construction of the below-ground skeleton 30B (for example the basement level and sub-basement level illustrated by double-dotted dashed lines in Fig. 8A). The slabs 34 of the ground level floor constructed before the below-ground skeleton 30B may be employed as an operation floor.

[0065] Note that in the exemplary embodiment illustrated in Fig. 8A, columns 50 are constructed as platform piles to support the slabs 34 before the slabs 34 of the ground level floor are constructed. The columns 50 may be formed from steel members such as H-section steel beams, or may be precast concrete columns. The columns 50 may also be employed as permanent columns. In such cases, the columns 50 employed as platform piles may be employed as permanent columns without further alteration, or may be covered by concrete cast in-situ.

[0066] The columns 50 may also be employed in cases such as the exemplary embodiment illustrated in Fig. 7, in which levels closer to ground level (for example an uppermost basement level) are constructed before levels closer to the foundation deck 12 (for example a sub-basement level).

[0067] Moreover, although the building 10 has an RC structure, exemplary embodiments of the present disclosure are not limited thereto. For example, the building 10 may have a steel

reinforced concrete structure or a steel-framed structure. As described above, various implementations of the present disclosure are possible.

[0068] The disclosure of Japanese Patent Application No. 2020-008308, filed on January 22, 2020, is incorporated in its entirety by reference herein. All cited documents, patent applications, and technical standards mentioned in the present specification are incorporated by reference in the present specification to the same extent as if each individual cited document, patent application, or technical standard was specifically and individually indicated to be incorporated by reference.

CLAIMS

1. A building construction method comprising:
 - constructing a foundation on an excavation face that is formed by excavating the ground;
 - installing, on the foundation, a plurality of columns configuring one portion of a below-ground core section;
 - constructing, on the columns, a wall-shaped above-ground core section that is coupled to tops of the columns;
 - constructing an above-ground skeleton peripheral to the above-ground core section, while the above-ground core section is being constructed; and
 - while the above-ground core section is being constructed, constructing a below-ground skeleton peripheral to the columns and constructing another portion of the below-ground core section, wherein the below-ground core section is constructed in a wall shape by constructing the other portion of the below-ground core section sequentially from bottom upward.
2. The building construction method of claim 1, wherein:
 - the columns are formed using precast concrete; and
 - the below-ground core section is formed by casting concrete between neighboring columns.
3. The building construction method of either claim 1 or claim 2, wherein additional installation of the columns is performed while the above-ground core section is being constructed.