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Assembled building structure with combination of steel structure and concrete structure and construction method thereof

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ABSTRACT

Provided are an assembled building structure with combination of steel structure and concrete structure and a construction method thereof, the assembled building structure comprises a wall body structure formed by mutually assembling and connecting a plurality of prefabricated wall plates in each of which a plurality of structure supporting steel pipes are arranged in a vertical direction; and a plurality of profile steel beams which are arranged at an upper end of the wall body structure and are fixedly connected with the structure supporting steel pipes in the prefabricated wall plates so as to form a steel structure building together with the structure supporting steel pipes. By fixed connection of the profile steel beams with the structure support steel pipes to form a steel structure framework, the bearing strength of the assemble house can be significantly improved so as to build a higher assembled house, thereby expanding the application of the modular buildings. Also provided is a construction method of an assembled building structure with combination of steel structure and concrete structure.

SPECIFICATION

Assembled Building Structure With Combination of Steel Structure and Concrete Structure and Construction Method Thereof

FIELD

The present application relates to the technical field of architectural engineering, and more particularly relates to a assembled building structure with combination of steel structure and concrete structure and a construction method thereof.

BACKGROUND

Thanks to its features such as simple manufacture, transportation convenience and quick installation, a modular building has been used more and more widely. However, in the existing field of modular building, with the limited bearing capacity of a assembled wall body and the limited bearing strength of the overall building structure of a assembled house, the prefabricated house may not be built too high, which restricts its application and affects the development of the modular building industry.

SUMMARY

To improve the bearing strength of the overall building structure of an assembled house, the present application provides an assembled building structure with combination of steel structure and concrete structure and a construction method thereof .

The present application is achieved by the following technical solution:

There is provided an assembled building structure with combination of steel structure and concrete structure, comprising: a wall body structure formed by mutually assembling and connecting a plurality of prefabricated wall plates in each of which a plurality of structure supporting steel pipes are arranged in a vertical direction; and a plurality of profile steel beams which are arranged at an upper end of the wall body structure and are fixedly connected with the structure supporting steel pipes in the prefabricated wall plates so as to form a steel structure building together with the structure supporting steel pipes.

A steel plate for connecting at least two profile steel beams together is arranged at a joint of adjacent profile steel beams.

Each profile steel beam is bridged on adjacent prefabricated wall plates so as to connect the adjacent prefabricated wall plates together.

Each of the structure supporting steel pipes is provided at an upper end with a steel pipe

connecting plate for fixed connection with the profile steel beam.

Each of the profile steel beams is formed, in a length direction of the profile steel beam, with a water and electricity installation groove having an opening parallel to a horizontal direction, in which supporting ribbed plates fixedly connected to an upper side wall and a lower side wall of the water and electricity installation groove are arranged.

The profile steel beams are I-shaped steel or H-shaped steel.

The structure supporting steel pipes are provided with up-down penetrating steel pipe vertical holes; the profile steel beams are provided with steel beam vertical holes communicated with the steel pipe vertical holes; the assembled building structure further comprises a floor slab mounted on the profile steel beams which is provided with floor slab vertical holes communicated with the steel beam vertical holes, and connecting steel bars inserted into the floor slab vertical holes, the steel beam vertical holes and the steel pipe vertical holes, wherein a grouting material is poured into the floor slab vertical holes, the steel beam vertical holes and the steel pipe vertical holes to connect the floor slab to the profile steel beams and the prefabricated wall plates.

Further provided is an assembled building house with combination of steel structure and concrete structure, comprising the assembled building structure with combination of steel structure and concrete structure described above.

Further provided is a construction method of an assembled building structure with combination of steel structure and concrete structure, comprising the following steps:

a. assembling and connecting a plurality of prefabricated wall plates to form a wall body structure;

b. installing profile steel beams at an upper end of the wall body structure, fixedly connecting the profile steel beams to structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to form a steel structure building together, and aligning steel beam vertical holes in the profile steel beams to steel pipe vertical holes in the structure supporting steel pipes;

c. paving a floor slab on upper sides of the profile steel beams, and aligning floor slab vertical holes in the floor slab to the steel beam vertical holes;

d. inserting connecting steel bars into the steel pipe vertical holes, the steel beam vertical holes and the floor slab vertical holes in a penetrating manner; and

e. pouring a grouting material into the steel pipe vertical holes, the steel beam vertical holes and the floor slab vertical holes in which the same connecting steel bars are inserted to fixedly

connect the prefabricated wall plates, the profile steel beams and floor slab.

The construction method of an assembled building structure with combination of steel structure and concrete structure described above further comprises the following step between Step b and Step c:

b1. connecting at least two profile steel beams together by a steel plate at a joint of adjacent profile steel beams.

Compared with the prior art, the present application has the following advantages.

1. According to the present application, the profile steel beams are arranged at the upper end of the wall body structure formed by assembling and connecting the prefabricated wall plates, and the profile steel beams are fixedly connected with the structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to jointly form a steel structure framework used as a basic framework of the assembled house, significantly improving the bearing strength of the assembled house adopting the assembled building structure with combination of steel structure and concrete structure. Therefore, compared with a traditional assembled house, the assembled house adopting the assembled building structure with combination of steel structure and concrete structure may be built higher, and a modular building also may be applicable to the field of high-rise buildings.

2. As the steel structure building jointly formed by the profile steel beams and the structure supporting pipes may effectively improve the overall bearing strength of the assembled house, the prefabricated wall plates of the assembled house adopting the assembled building structure with combination of steel structure and concrete structure may be made of a lighter material in comparison to the traditional assembled house . Therefore, the assembled house is convenient to transport, saves the construction cost and has an extremely high market prospect.

BRIEF DESCRIPTION OF THE DRAWINGS

To describe technical solutions in embodiments of the present application more clearly, accompanying drawings required in descriptions of the embodiments will be briefly introduced below.

Fig. 1 is a schematic diagram of a prefabricated wall plate;

Fig. 2 is a schematic diagram of an internal structure of the prefabricated wall plate;

Fig. 3 is a schematic diagram of a wall body structure formed by assembling and connecting the prefabricated wall plates;

Fig. 4 is a structure schematic diagram I of installing profile steel beams at the upper end of the

wall body structure;

Fig. 5 is a structure schematic diagram II of installing profile steel beams at the upper end of the wall body structure;

Fig. 6 is a structure schematic diagram III of installing profile steel beams at the upper end of the wall body structure;

Fig. 7 is a structure schematic diagram of installing steel plates on the profile steel beams; and

Fig. 8 is a structure schematic diagram after a floor slab is paved on the upper sides of the profile steel beams.

DETAILED DESCRIPTION OF THE EMBODIMENTS

An assembled building structure with combination of steel structure and concrete structure as shown in the drawings includes a wall body structure 2 of Fig. 3 formed by mutually assembling and connecting a plurality of prefabricated wall plates 1 of Fig.1. Each prefabricated wall plate 1 is generally a concrete wall plate, and also may be other light-weight wall plate. As shown in Fig. 2, a plurality of structure supporting steel pipes 3 arranged along a vertical direction are arranged in the prefabricated wall plates 1. As shown in Figs. 4 to 6, the assembled building structure further includes a plurality of profile steel beams 4 which are arranged at the upper end of the wall body structure 2 and are fixedly connected with the structure supporting steel pipes 3 in the prefabricated wall plates 1 so as to form a steel structure building together with the structure supporting steel pipes 3. To further improve the connecting stability between adjacent prefabricated wall plates 1, the profile steel beams 4 are bridged on the adjacent prefabricated wall plates 1 so as to connect the adjacent prefabricated wall plates 1 together. The profile steel beams are installed at the upper end of the wall body structure formed by assembling and connecting the prefabricated wall plates, and the profile steel beams are fixedly connected with the structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to jointly form a steel structure framework used as a basic framework of an assembled house, significantly improving the bearing strength of the assembled house using the assembled building structure with combination of steel structure and concrete structure. Therefore, compared with a traditional assembled house, the assembled house adopting the assembled building structure with combination of steel structure and concrete structure may be built higher, and a modular building also may be applicable to the field of high-rise buildings. In addition, as the steel structure building jointly formed by the profile steel beams and the structure supporting pipes may effectively improve the overall bearing strength of the assembled house, the prefabricated wall plates of the assembled

house adopting the assembled building structure with combination of steel structure and concrete structure may be made of a lighter material in comparison to the traditional assembled house. Therefore, the assembled house is convenient to transport, saves the construction cost and has an extremely high market prospect.

Further, to connect adjacent profile steel beams 4 together stably and firmly, as shown in Fig. 7, a steel plate 7 for connecting at least two profile steel beams 4 together is arranged at a joint of adjacent profile steel beams 4. The steel plates 7 may be arranged on the upper sides and/or the lower sides of the profile steel beams 4 so as to stably connect the adjacent profile steel beams 4 together.

To fixedly connect, such as weld, the profile steel beams 4 to the structure supporting steel pipes 3 conveniently, steel pipe connecting plates 31 fixedly connected with the profile steel beams 4 are arranged at the upper ends of the structure supporting steel pipes 3. By the arrangement of the steel pipe connecting plates 31, the contact area between the structure supporting steel pipes 3 and the profile steel beams 4 may be increased, facilitating to weld the profile steel beams 4 onto the steel pipe connecting plates 31 and thereby onto the structure supporting steel pipes 3.

During assembling of the assembled building structure with combination of steel structure and concrete structure, to reserve a pulling line space for pulling and connecting water and electricity lines, water and electricity installation grooves 41 having openings parallel to a horizontal direction are formed in the profile steel beams 4 along length directions of the profile steel beams 4, and supporting ribbed plates 42 fixedly connected to the upper side walls and the lower side walls of the water and electricity installation grooves 41 are arranged in the water and electricity installation grooves 41. To achieve the above-mentioned technical effects, the profile steel beams 4 are preferably I-shaped steel or H-shaped steel.

The structure supporting steel pipes 3 are provided with up-down penetrating steel pipe vertical holes 32. The profile steel beams 4 are provided with steel beam vertical holes 43 communicated with the steel pipe vertical holes 32. The assembled building structure with combination of steel structure and concrete structure further includes a floor slab 5 mounted on the profile steel beams 4. Floor slab vertical holes 51 communicated with the steel beam vertical holes 43 are formed in the floor slab 5. To stably and firmly connect the floor slab 5, the profile steel beams 4 and the prefabricated wall plates 1, connecting steel bars 6 are inserted into the floor slab vertical holes 51, the steel beam vertical holes 43 and the steel pipe vertical holes 32, and a grouting material is poured into the floor slab vertical holes 51, the steel beam vertical holes 43 and the steel pipe vertical holes 32 to connect the floor slab 5 to the profile steel beams 4 and the prefabricated

wall plates 1. Preferably, the grouting material is a high-strength grouting material.

The present embodiment further provides an assembled house with combination of steel structure and concrete structure, including the above-mentioned assembled building structure with combination of steel structure and concrete structure. By the steel structure formed by the structure supporting steel pipes 3 and the profile steel beams 4, concrete of the prefabricated wall plates 1, and grouting material structures in the floor slab vertical holes 51, the steel beam vertical holes 43 and the steel pipe vertical holes 32, an assembled building house with combination of steel structure and concrete structure is formed, which, compared with the traditional assembled house, has high bearing strength, may be built higher and has wider application.

The present embodiment further provides a construction method of an assembled building structure with combination of steel structure and concrete structure, including:

a. assembling and connecting a plurality of prefabricated wall plates 1 to form a wall body structure 2;

b. installing profile steel beams 4 at an upper end of the wall body structure 2, fixedly connecting the profile steel beams 4 with structure supporting steel pipes 3 in the prefabricated wall plates 1 to enable the profile steel beams 4 and the structure supporting steel pipes 3 to form a steel structure building together, and steel beam vertical holes 43 in the profile steel beams 4 being aligned with steel pipe vertical holes 32 in the structure supporting steel pipes 3;

c. paving a floor slab 5 on upper sides of the profile steel beams 4, and floor slab vertical holes 51 in the floor slab 5 being aligned with the steel beam vertical holes 43;

d. inserting connecting steel bars 6 into the steel pipe vertical holes 32, the steel beam vertical holes 43 and the floor slab vertical holes 51 in a penetrating manner; and

e. pouring a grouting material into the steel pipe vertical holes 32, the steel beam vertical holes 43 and the floor slab vertical holes 51 in which the same connecting steel bars 6 are inserted to fixedly connect the prefabricated wall plates 1, the profile steel beams 4 and floor slab 5.

The above-mentioned construction method further includes the following step between Step b and Step c:

b1. connecting at least two profile steel beams 4 together by adopting a steel plate 7 at a joint of adjacent profile steel beams 4.

The working principle of the present embodiment is as follows.

The profile steel beams are installed at the upper end of the wall body structure formed by assembling and connecting the prefabricated wall plates, and the profile steel beams are fixedly

connected with the structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to jointly form a steel structure framework used as a basic framework of an assembled house, significantly improving the bearing strength of the assembled house adopting the assembled building structure with combination of steel structure and concrete structure. Therefore, the assembled building structure with combination of steel structure and concrete structure may be applied to the field of high-rise buildings, expanding the application of modular buildings.

As mentioned above, it is an embodiment provided in combination with specific contents, but is not deemed that specific embodiment of the present application is only limited to these descriptions. Any technical deductions or replacements similar to or identical with the method, structure and the like of the present application or made without departing from the concept of the present application shall all fall within the protection scope of the present application.

CLAIMS

1. An assembled building structure with combination of steel structure and concrete structure, comprising

a wall body structure (2) formed by mutually assembling and connecting a plurality of prefabricated wall plates (1) in each of which a plurality of structure supporting steel pipes (3) are arranged in a vertical direction; and

a plurality of profile steel beams (4) which are arranged at an upper end of the wall body structure (2) and are fixedly connected with the structure supporting steel pipes (3) in the prefabricated wall plates (1) so as to form a steel structure building together with the structure supporting steel pipes (3).

2. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein a steel plate (7) for connecting at least two profile steel beams (4) together is arranged at a joint of adjacent profile steel beams (4).

3. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein each profile steel beam (4) is bridged on adjacent prefabricated wall plates (1) so as to connect the adjacent prefabricated wall plates (1) together.

4. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein each of the structure supporting steel pipes (3) is provided at an upper end with a steel pipe connecting plate (31) for fixed connection with the profile steel beam (4).

5. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein each of the profile steel beams (4) is formed, in a length direction of the profile steel beam (4), with a water and electricity installation groove (41) having an opening parallel to a horizontal direction, in which supporting ribbed plates (42) fixedly connected to an upper side wall and a lower side wall of the water and electricity installation groove (41) are arranged.

6. The assembled building structure with combination of steel structure and concrete structure of claim 5, wherein the profile steel beams (4) are I-shaped steel or H-shaped steel.

7. The assembled building structure with combination of steel structure and concrete structure of claim 1,

wherein the structure supporting steel pipes (3) are provided with up-down penetrating

steel pipe vertical holes (32); the profile steel beams (4) are provided with steel beam vertical holes (43) communicated with the steel pipe vertical holes (32);

the assembled building structure further comprises a floor slab (5) mounted on the profile steel beams (4) which is provided with floor slab vertical holes (51) communicated with the steel beam vertical holes (43), and connecting steel bars (6) inserted into the floor slab vertical holes (51), the steel beam vertical holes (43) and the steel pipe vertical holes (32), wherein a grouting material is poured into the floor slab vertical holes (51), the steel beam vertical holes (43) and the steel pipe vertical holes (32) to connect the floor slab (5) to the profile steel beams (4) and the prefabricated wall plates (1).

8. An assembled building house with combination of steel structure and concrete structure, comprising the assembled building structure with combination of steel structure and concrete structure of any one of claims 1 to 7.

9. A construction method of an assembled building structure with combination of steel structure and concrete structure, comprising the following steps:

a. assembling and connecting a plurality of prefabricated wall plates (1) to form a wall body structure (2);

b. installing profile steel beams (4) at an upper end of the wall body structure (2), fixedly connecting the profile steel beams (4) to structure supporting steel pipes (3) in the prefabricated wall plates (1) to enable the profile steel beams (4) and the structure supporting steel pipes (3) to form a steel structure building together, and aligning steel beam vertical holes (43) in the profile steel beams (4) to steel pipe vertical holes (32) in the structure supporting steel pipes (3);

c. paving a floor slab (5) on upper sides of the profile steel beams (4), and aligning floor slab vertical holes (51) in the floor slab (5) to the steel beam vertical holes (43);

d. inserting connecting steel bars (6) into the steel pipe vertical holes (32), the steel beam vertical holes (43) and the floor slab vertical holes (51) in a penetrating manner; and

e. pouring a grouting material into the steel pipe vertical holes (32), the steel beam vertical holes (43) and the floor slab vertical holes (51) in which the same connecting steel bars (6) are inserted to fixedly connect the prefabricated wall plates (1), the profile steel beams (4) and floor slab (5).

10. The construction method of an assembled building structure with combination of steel structure and concrete structure of claim 9, further comprising the following step

between Step b and Step c:

b1. connecting at least two profile steel beams (4) together by a steel plate (7) at a joint of adjacent profile steel beams (4).

Assembled Building Structure With Combination of Steel Structure and Concrete Structure and Construction Method Thereof

FIELD

The present application relates to the technical field of architectural engineering, and more particularly relates to an assembled building structure with combination of steel structure and concrete structure and a construction method thereof.

BACKGROUND

Thanks to its features such as simple manufacture, transportation convenience and quick installation, a modular building has been used more and more widely. However, in the existing field of modular building, with the limited bearing capacity of an assembled wall body and the limited bearing strength of the overall building structure of an assembled house, the prefabricated house may not be built too high, which restricts its application and affects the development of the modular building industry.

SUMMARY

To improve the bearing strength of the overall building structure of an assembled house, the present application provides an assembled building structure with combination of steel structure and concrete structure and a construction method thereof.

The present application is achieved by the following technical solution:

There is provided an assembled building structure with combination of steel structure and concrete structure, comprising: a wall body structure formed by mutually assembling and connecting a plurality of prefabricated wall plates in each of which a plurality of structure supporting steel pipes are arranged in a vertical direction; and a plurality of profile steel beams which are arranged at an upper end of the wall body structure and are fixedly connected with the structure supporting steel pipes in the prefabricated wall plates so as to form a steel structure building together with the structure supporting steel pipes.

A steel plate for connecting at least two profile steel beams together is arranged at a joint of adjacent profile steel beams.

Each profile steel beam is bridged on adjacent prefabricated wall plates so as to connect the adjacent prefabricated wall plates together.

Each of the structure supporting steel pipes is provided at an upper end with a steel pipe

connecting plate for fixed connection with the profile steel beam.

Each of the profile steel beams is formed, in a length direction of the profile steel beam, with a water and electricity installation groove having an opening parallel to a horizontal direction, in which supporting ribbed plates fixedly connected to an upper side wall and a lower side wall of the water and electricity installation groove are arranged.

The profile steel beams are I-shaped steel or H-shaped steel.

The structure supporting steel pipes are provided with up-down penetrating steel pipe vertical holes; the profile steel beams are provided with steel beam vertical holes communicated with the steel pipe vertical holes; the assembled building structure further comprises a floor slab mounted on the profile steel beams which is provided with floor slab vertical holes communicated with the steel beam vertical holes, and connecting steel bars inserted into the floor slab vertical holes, the steel beam vertical holes and the steel pipe vertical holes, wherein a grouting material is poured into the floor slab vertical holes, the steel beam vertical holes and the steel pipe vertical holes to connect the floor slab to the profile steel beams and the prefabricated wall plates.

Further provided is an assembled building house with combination of steel structure and concrete structure, comprising the assembled building structure with combination of steel structure and concrete structure described above.

Further provided is a construction method of an assembled building structure with combination of steel structure and concrete structure, comprising the following steps:

a. assembling and connecting a plurality of prefabricated wall plates to form a wall body structure;

b. installing profile steel beams at an upper end of the wall body structure, fixedly connecting the profile steel beams to structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to form a steel structure building together, and aligning steel beam vertical holes in the profile steel beams to steel pipe vertical holes in the structure supporting steel pipes;

c. paving a floor slab on upper sides of the profile steel beams, and aligning floor slab vertical holes in the floor slab to the steel beam vertical holes;

d. inserting connecting steel bars into the steel pipe vertical holes, the steel beam vertical holes and the floor slab vertical holes in a penetrating manner; and

e. pouring a grouting material into the steel pipe vertical holes, the steel beam vertical holes and the floor slab vertical holes in which the same connecting steel bars are inserted to fixedly

connect the prefabricated wall plates, the profile steel beams and floor slab.

The construction method of an assembled building structure with combination of steel structure and concrete structure described above further comprises the following step between Step b and Step c:

b1. connecting at least two profile steel beams together by a steel plate at a joint of adjacent profile steel beams.

Compared with the prior art, the present application has the following advantages.

1. According to the present application, the profile steel beams are arranged at the upper end of the wall body structure formed by assembling and connecting the prefabricated wall plates, and the profile steel beams are fixedly connected with the structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to jointly form a steel structure framework used as a basic framework of the assembled house, significantly improving the bearing strength of the assembled house adopting the assembled building structure with combination of steel structure and concrete structure. Therefore, compared with a traditional assembled house, the assembled house adopting the assembled building structure with combination of steel structure and concrete structure may be built higher, and a modular building also may be applicable to the field of high-rise buildings.

2. As the steel structure building jointly formed by the profile steel beams and the structure supporting pipes may effectively improve the overall bearing strength of the assembled house, the prefabricated wall plates of the assembled house adopting the assembled building structure with combination of steel structure and concrete structure may be made of a lighter material in comparison to the traditional assembled house. Therefore, the assembled house is convenient to transport, saves the construction cost and has an extremely high market prospect.

BRIEF DESCRIPTION OF THE DRAWINGS

To describe technical solutions in embodiments of the present application more clearly, accompanying drawings required in descriptions of the embodiments will be briefly introduced below.

Fig. 1 is a schematic diagram of a prefabricated wall plate;

Fig. 2 is a schematic diagram of an internal structure of the prefabricated wall plate;

Fig. 3 is a schematic diagram of a wall body structure formed by assembling and connecting the prefabricated wall plates;

Fig. 4 is a structure schematic diagram I of installing profile steel beams at the upper end of the

wall body structure;

Fig. 5 is a structure schematic diagram II of installing profile steel beams at the upper end of the wall body structure;

Fig. 6 is a structure schematic diagram III of installing profile steel beams at the upper end of the wall body structure;

Fig. 7 is a structure schematic diagram of installing steel plates on the profile steel beams; and

Fig. 8 is a structure schematic diagram after a floor slab is paved on the upper sides of the profile steel beams.

DETAILED DESCRIPTION OF THE EMBODIMENTS

An assembled building structure with combination of steel structure and concrete structure as shown in the drawings includes a wall body structure 2 of Fig. 3 formed by mutually assembling and connecting a plurality of prefabricated wall plates 1 of Fig.1. Each prefabricated wall plate 1 is generally a concrete wall plate, and also may be other light-weight wall plate. As shown in Fig. 2, a plurality of structure supporting steel pipes 3 arranged along a vertical direction are arranged in the prefabricated wall plates 1. As shown in Figs. 4 to 6, the assembled building structure further includes a plurality of profile steel beams 4 which are arranged at the upper end of the wall body structure 2 and are fixedly connected with the structure supporting steel pipes 3 in the prefabricated wall plates 1 so as to form a steel structure building together with the structure supporting steel pipes 3. To further improve the connecting stability between adjacent prefabricated wall plates 1, the profile steel beams 4 are bridged on the adjacent prefabricated wall plates 1 so as to connect the adjacent prefabricated wall plates 1 together. The profile steel beams are installed at the upper end of the wall body structure formed by assembling and connecting the prefabricated wall plates, and the profile steel beams are fixedly connected with the structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to jointly form a steel structure framework used as a basic framework of an assembled house, significantly improving the bearing strength of the assembled house using the assembled building structure with combination of steel structure and concrete structure. Therefore, compared with a traditional assembled house, the assembled house adopting the assembled building structure with combination of steel structure and concrete structure may be built higher, and a modular building also may be applicable to the field of high-rise buildings. In addition, as the steel structure building jointly formed by the profile steel beams and the structure supporting pipes may effectively improve the overall bearing strength of the assembled house, the prefabricated wall plates of the assembled

house adopting the assembled building structure with combination of steel structure and concrete structure may be made of a lighter material in comparison to the traditional assembled house. Therefore, the assembled house is convenient to transport, saves the construction cost and has an extremely high market prospect.

Further, to connect adjacent profile steel beams 4 together stably and firmly, as shown in Fig. 7, a steel plate 7 for connecting at least two profile steel beams 4 together is arranged at a joint of adjacent profile steel beams 4. The steel plates 7 may be arranged on the upper sides and/or the lower sides of the profile steel beams 4 so as to stably connect the adjacent profile steel beams 4 together.

To fixedly connect, such as weld, the profile steel beams 4 to the structure supporting steel pipes 3 conveniently, steel pipe connecting plates 31 fixedly connected with the profile steel beams 4 are arranged at the upper ends of the structure supporting steel pipes 3. By the arrangement of the steel pipe connecting plates 31, the contact area between the structure supporting steel pipes 3 and the profile steel beams 4 may be increased, facilitating to weld the profile steel beams 4 onto the steel pipe connecting plates 31 and thereby onto the structure supporting steel pipes 3.

During assembling of the assembled building structure with combination of steel structure and concrete structure, to reserve a pulling line space for pulling and connecting water and electricity lines, water and electricity installation grooves 41 having openings parallel to a horizontal direction are formed in the profile steel beams 4 along length directions of the profile steel beams 4, and supporting ribbed plates 42 fixedly connected to the upper side walls and the lower side walls of the water and electricity installation grooves 41 are arranged in the water and electricity installation grooves 41. To achieve the above-mentioned technical effects, the profile steel beams 4 are preferably I-shaped steel or H-shaped steel.

The structure supporting steel pipes 3 are provided with up-down penetrating steel pipe vertical holes 32. The profile steel beams 4 are provided with steel beam vertical holes 43 communicated with the steel pipe vertical holes 32. The assembled building structure with combination of steel structure and concrete structure further includes a floor slab 5 mounted on the profile steel beams 4. Floor slab vertical holes 51 communicated with the steel beam vertical holes 43 are formed in the floor slab 5. To stably and firmly connect the floor slab 5, the profile steel beams 4 and the prefabricated wall plates 1, connecting steel bars 6 are inserted into the floor slab vertical holes 51, the steel beam vertical holes 43 and the steel pipe vertical holes 32, and a grouting material is poured into the floor slab vertical holes 51, the steel beam vertical holes 43 and the steel pipe vertical holes 32 to connect the floor slab 5 to the profile steel beams 4 and the prefabricated

wall plates 1. Preferably, the grouting material is a high-strength grouting material.

The present embodiment further provides an assembled house with combination of steel structure and concrete structure, including the above-mentioned assembled building structure with combination of steel structure and concrete structure. By the steel structure formed by the structure supporting steel pipes 3 and the profile steel beams 4, concrete of the prefabricated wall plates 1, and grouting material structures in the floor slab vertical holes 51, the steel beam vertical holes 43 and the steel pipe vertical holes 32, an assembled building house with combination of steel structure and concrete structure is formed, which, compared with the traditional assembled house, has high bearing strength, may be built higher and has wider application.

The present embodiment further provides a construction method of an assembled building structure with combination of steel structure and concrete structure, including:

a. assembling and connecting a plurality of prefabricated wall plates 1 to form a wall body structure 2;

b. installing profile steel beams 4 at an upper end of the wall body structure 2, fixedly connecting the profile steel beams 4 with structure supporting steel pipes 3 in the prefabricated wall plates 1 to enable the profile steel beams 4 and the structure supporting steel pipes 3 to form a steel structure building together, and steel beam vertical holes 43 in the profile steel beams 4 being aligned with steel pipe vertical holes 32 in the structure supporting steel pipes 3;

c. paving a floor slab 5 on upper sides of the profile steel beams 4, and floor slab vertical holes 51 in the floor slab 5 being aligned with the steel beam vertical holes 43;

d. inserting connecting steel bars 6 into the steel pipe vertical holes 32, the steel beam vertical holes 43 and the floor slab vertical holes 51 in a penetrating manner; and

e. pouring a grouting material into the steel pipe vertical holes 32, the steel beam vertical holes 43 and the floor slab vertical holes 51 in which the same connecting steel bars 6 are inserted to fixedly connect the prefabricated wall plates 1, the profile steel beams 4 and floor slab 5.

The above-mentioned construction method further includes the following step between Step b and Step c:

b1. connecting at least two profile steel beams 4 together by adopting a steel plate 7 at a joint of adjacent profile steel beams 4.

The working principle of the present embodiment is as follows.

The profile steel beams are installed at the upper end of the wall body structure formed by assembling and connecting the prefabricated wall plates, and the profile steel beams are fixedly

connected with the structure supporting steel pipes in the prefabricated wall plates to enable the profile steel beams and the structure supporting steel pipes to jointly form a steel structure framework used as a basic framework of an assembled house, significantly improving the bearing strength of the assembled house adopting the assembled building structure with combination of steel structure and concrete structure. Therefore, the assembled building structure with combination of steel structure and concrete structure may be applied to the field of high-rise buildings, expanding the application of modular buildings.

As mentioned above, it is an embodiment provided in combination with specific contents, but is not deemed that specific embodiment of the present application is only limited to these descriptions. Any technical deductions or replacements similar to or identical with the method, structure and the like of the present application or made without departing from the concept of the present application shall all fall within the protection scope of the present application.

Through-out the specification and claims the word “comprise” and its derivatives is intended to have an inclusive rather than exclusive meaning unless the context requires otherwise.

The above references to and descriptions of prior proposals or products are not intended to be, and are not to be construed as, statements or admissions of common general knowledge in the art. In particular, the above prior art discussion does not relate to what is commonly or well known by the person skilled in the art, but assists in the understanding of the inventive step of the present invention of which the identification of pertinent prior art proposals is but one part.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An assembled building structure with combination of steel structure and concrete structure, comprising

a wall body structure (2) formed by mutually assembling and connecting a plurality of prefabricated wall plates (1) in each of which a plurality of structure supporting steel pipes (3) are arranged in a vertical direction; and

a plurality of profile steel beams (4) which are arranged at an upper end of the wall body structure (2) and are fixedly connected with the structure supporting steel pipes (3) in the prefabricated wall plates (1) so as to form a steel structure building together with the structure supporting steel pipes (3).

2. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein a steel plate (7) for connecting at least two profile steel beams (4) together is arranged at a joint of adjacent profile steel beams (4).

3. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein each profile steel beam (4) is bridged on adjacent prefabricated wall plates (1) so as to connect the adjacent prefabricated wall plates (1) together.

4. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein each of the structure supporting steel pipes (3) is provided at an upper end with a steel pipe connecting plate (31) for fixed connection with the profile steel beam (4).

5. The assembled building structure with combination of steel structure and concrete structure of claim 1, wherein each of the profile steel beams (4) is formed, in a length direction of the profile steel beam (4), with a water and electricity installation groove (41) having an opening parallel to a horizontal direction, in which supporting ribbed plates (42) fixedly connected to an upper side wall and a lower side wall of the water and electricity installation groove (41) are arranged.

6. The assembled building structure with combination of steel structure and concrete structure of claim 5, wherein the profile steel beams (4) are I-shaped steel or H-shaped steel.

7. The assembled building structure with combination of steel structure and concrete structure of claim 1,

wherein the structure supporting steel pipes (3) are provided with up-down penetrating steel pipe vertical holes (32); the profile steel beams (4) are provided with steel beam vertical holes (43) communicated with the steel pipe vertical holes (32);

the assembled building structure further comprises a floor slab (5) mounted on the profile steel beams (4) which is provided with floor slab vertical holes (51) communicated with the steel beam vertical holes (43), and connecting steel bars (6) inserted into the floor slab vertical holes (51), the steel beam vertical holes (43) and the steel pipe vertical holes (32), wherein a grouting material is poured into the floor slab vertical holes (51), the steel beam vertical holes (43) and the steel pipe vertical holes (32) to connect the floor slab (5) to the profile steel beams (4) and the prefabricated wall plates (1).

8. An assembled building house with combination of steel structure and concrete structure, comprising the assembled building structure with combination of steel structure and concrete structure of any one of claims 1 to 7.

9. A construction method of an assembled building structure with combination of steel structure and concrete structure, comprising the following steps:

a. assembling and connecting a plurality of prefabricated wall plates (1) to form a wall body structure (2);

b. installing profile steel beams (4) at an upper end of the wall body structure (2), fixedly connecting the profile steel beams (4) to structure supporting steel pipes (3) in the prefabricated wall plates (1) to enable the profile steel beams (4) and the structure supporting steel pipes (3) to form a steel structure building together, and aligning steel beam vertical holes (43) in the profile steel beams (4) to steel pipe vertical holes (32) in the structure supporting steel pipes (3);

c. paving a floor slab (5) on upper sides of the profile steel beams (4), and aligning floor slab vertical holes (51) in the floor slab (5) to the steel beam vertical holes (43);

d. inserting connecting steel bars (6) into the steel pipe vertical holes (32), the steel beam vertical holes (43) and the floor slab vertical holes (51) in a penetrating manner; and

e. pouring a grouting material into the steel pipe vertical holes (32), the steel beam vertical holes (43) and the floor slab vertical holes (51) in which the same connecting steel bars (6) are inserted to fixedly connect the prefabricated wall plates (1), the profile steel beams (4) and floor slab (5).

10. The construction method of an assembled building structure with combination of

steel structure and concrete structure of claim 9, further comprising the following step between Step b and Step c:

b1. connecting at least two profile steel beams (4) together by a steel plate (7) at a joint of adjacent profile steel beams (4).