

A prefabricated element of a multi-storey building and a semi-prefabricating construction method thereof

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Technical Field

The invention relates to construction of a multi-storey building, more specifically to a prefabricated element of a multi-storey building and a semi-prefabricating construction method of using the prefabricated element to construct a multi-storey building.

Background

15 Nowadays buildings generally include several stories or even more than ten stories in order to save land resource. A conventional construction method for a multi-storey building typically includes: 1) establishing a reinforcement mat that forms a load-bearing wall frame, mounting a formwork around the reinforcement mat, and then pouring concrete into the formwork, thus forming a load-bearing wall; 2) 20 mounting a formwork forming a floor plate frame and being supported by a series of supporting brackets, laying reinforcing steel bars in the formwork and then pouring concrete therein, thus producing a floor plate; 3) removing the supporting brackets of the floor plate in the next lower floor, and completing construction of the previous floor according to the above-mentioned steps. The conventional method has the 25 defects of a long construction period and a high construction cost due to storey-to-storey and plate-by-plate construction. In addition, the method causes a serious pollution problem, and fails to ensure the building has a unified quality standard.

30 To this end, Chinese patent ZL97125767.1 discloses a semi-prefabricating construction method for a high-risen building. As shown in Fig. 1, the method includes: firstly, prefabricating a rising plate unit (i.e., outer wall) 1 and a floor plate unit 3, hoisting the rising plate unit 1 to a predetermined position, and then locking a lateral bracket 5 on both sides of the rising plate unit 1 and a vertical bracket 4 35 extending from the top of the rising plate unit in the next lower floor together, thus achieving a temporary anchorage of the rising plate unit 1; secondly, casting a load-bearing cross wall 2, ensuring the reinforcing steel bars of the load-bearing cross wall 2 and those of the rising plate unit 1 being connected with each other, and

then burying the edges of the rising plate unit 1 (i.e., the lateral and vertical brackets locked together) into the load-bearing cross wall 2; finally, laying the prefabricated floor plate unit 3, enabling the prefabricated floor plate unit 3 being integrated with a cast-in-situ concrete layer, thus forming the floor plate. The patent solves the problems of long construction period and low standardization of construction in the conventional method. However, since brackets have to be arranged on both sides and the top of the rising plate unit 1, the bracket of the upper floor has to be in an exact alignment with that of the lower floor during installation of brackets. Also, the aligned brackets need to be buried into the load-bearing cross wall 2. Therefore, inevitably the construction period is prolonged and the construction cost is increased.

Summary

The problem addressed by the invention is to provide a prefabricated element of a multi-storey building and a semi-prefabricating construction method thereof, so that the construction efficiency is significantly enhanced, the construction period is shortened and thus the cost is reduced.

According to the invention, a prefabricated element of a multi-storey building is provided. The prefabricated element includes a prefabricated outer wall having a reinforcing cement (RC) wall, each of both side faces of the RC wall being provided with a recess therein. A plurality of exposed reinforcing steel bars are extended from both side faces of the RC wall, and fixedly connected to a reinforcement mat in an adjacent cast-in-situ load-bearing cross wall in the same floor.

The upper and lower end faces of the RC wall both have a step-like structure, forming two parts having different heights, and the step-like structures of the end faces of two prefabricated outer walls of adjacent floors match with each other in a shape-complemental manner.

An upper nut and a lower nut are pre-buried in suitable positions in the inner surface of the RC wall of the prefabricated outer wall, in order to fix the prefabricated outer wall temporarily.

The prefabricated element of a multi-storey building further comprises a prefabricated floor plate having a rough upper surface, wherein a through hole is provided in the prefabricated floor plate for fixing the prefabricated outer wall temporarily.

The prefabricated floor plate serves as the lower portion of a whole floor plate unit, wherein a completed semi-prefabricated floor plate is formed by securely combining the prefabricated floor plate with a cast-in-situ concrete floor plate containing a reinforcement mat therein, and wherein the prefabricated floor plate is mounted firstly during installation, and it also serves as the formwork for the cast-in-situ concrete floor plate thereon.

A window is arranged in the RC wall of the prefabricated outer wall.

According to the invention, a semi-prefabricating construction method for a multi-storey building with use of a prefabricated element including a prefabricated outer wall and a prefabricated floor plate is further provided. The method comprises the following steps:

Step A: placing the prefabricated floor plate on the top of the load-bearing cross walls and the prefabricated outer wall defined therebetween in the next lower floor;

Step B: laying floor plate reinforcing steel bars on the prefabricated floor plate and casting concrete to form a cast-in-situ concrete floor plate, wherein the prefabricated floor plate and the cast-in-situ concrete floor plate are combined into one piece so as to form a semi-prefabricated floor plate;

Step C: hoisting the prefabricated outer wall to a target position and temporarily securing the prefabricated outer wall by means of a telescopic rod and a triangular support, so that the prefabricated outer wall is kept in the vertical direction with respect to the semi-prefabricated floor plate;

Step D: starting from the exposed reinforcing steel bars that extend from the side faces of the prefabricated outer wall, building a cross wall reinforcement mat, which forms a wall frame, around the prefabricated outer wall, and casting concrete in the cross wall reinforcement mat so as to form the load-bearing cross wall, wherein the prefabricated outer wall are held by at least two load-bearing cross walls; and

Repeating Steps A to D to construct the upper floor until the uppermost floor is completed.

In the semi-prefabricating construction method for a multi-storey building, Step B further includes: inserting a conduit into a through hole of the prefabricated floor plate before casting concrete, and removing the conduit after concrete reaches a certain strength.

In the semi-prefabricating construction method for a multi-storey building, Step C specifically includes:

Step C1: allowing a suitable first screw rod to pass through a hole at one end of the telescopic rod, and connecting the first screw rod to an upper nut pre-buried in the prefabricated outer wall;

5 Step C2: allowing a suitable second screw rod to pass through a hole at the other end of the telescopic rod and further pass through a through hole in the prefabricated floor plate, and then securing the telescopic rod on the semi-prefabricated floor plate with a nut;

10 Step C3: allowing a suitable third screw rod to pass through a hole at one end of the triangular support, and connecting the third screw rod to a lower nut pre-buried in the prefabricated outer wall;

Step C4: allowing a suitable fourth screw rod to pass through a hole at the other end of the triangular support and further pass through a through hole in the prefabricated floor plate, and then securing the triangular support on the semi-prefabricated floor plate with a nut;

15 Step C5: adjusting the length of the telescopic rod, thus keeping the prefabricated outer wall in the vertical direction with respect to the semi-prefabricated floor plate.

In the semi-prefabricating construction method for a multi-storey building, Step C further includes: when temporarily securing the prefabricated outer wall by means of the telescopic rod and the triangular support, placing a wedge either from the inner side or the outer side of the prefabricated outer wall at its bottom, so as to maintain a suitable space between the prefabricated outer wall and another prefabricated outer wall in the next lower floor, wherein cement slurry is poured in the space and a waterproof treatment is carried out, enabling the prefabricated outer wall and the prefabricated outer wall in the next lower floor being tightly connected.

The waterproof treatment includes coating water-resistant adhesive or affixing tapes at the joint area of two prefabricated outer walls adjacent to each other in the vertical direction.

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The semi-prefabricating construction method for a multi-storey building further includes, after Step D of forming the load-bearing cross wall, a step: removing the triangular support and the telescopic rod after the concrete of the load-bearing cross wall reaches a certain strength.

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Compared with the prior arts, the invention provides the following advantageous technical effects: with the telescopic rod and the triangular support for temporarily securing the prefabricated outer wall, the bracket structure extending from both sides

and the top of the prefabricated outer wall in the prior arts is unnecessary, so that the steps of mounting and connecting the bracket structure and casting concrete therefor can be omitted, thus significantly enhancing the construction efficiency and shortening the construction period. Moreover, since the expenditure on the prefabricated outer wall is reduced and the construction period is shortened, the overall construction cost can be lowered.

Brief Description of Drawings

Fig. 1 schematically shows the construction method for a multi-storey building in the prior art.

Fig. 2 schematically shows the structure of the prefabricated outer wall in the prefabricated element of a multi-storey building according to the invention.

Fig. 3 is the enlarged view of the side end of the prefabricated outer wall.

Fig. 4 schematically shows the structure of the prefabricated floor plate in the prefabricated element of a multi-storey building according to the invention.

Fig. 5 schematically shows the structure of the triangular steel support for temporarily fixing the prefabricated outer wall and the fixing way according to the invention.

Fig. 6 schematically shows the entire floor after constructing the ground floor with the semi-prefabricating construction method for a multi-storey building according to the invention.

Fig. 7 schematically shows the way of laying the prefabricated floor plate in the semi-prefabricating construction method for a multi-storey building according to the invention.

Fig. 8 schematically shows the way of laying floor plate reinforcing steel bars on the prefabricated floor plate in the semi-prefabricating construction method for a multi-storey building according to the invention.

Fig. 9 schematically shows the way of casting concrete in the floor plate reinforcing steel bars so as to form a semi-prefabricated floor plate in the semi-prefabricating construction method for a multi-storey building according to the invention.

Fig. 10 schematically shows the way of temporarily fixing the prefabricated outer wall in the semi-prefabricating construction method for a multi-storey building according to the invention.

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Fig. 11 schematically shows the way of temporarily fixing the prefabricated outer wall and adjusting its direction through a telescopic rod in the semi-prefabricating construction method for a multi-storey building according to the invention.

10 Fig. 12 schematically shows the way of casting the space between the prefabricated outer wall and another prefabricated outer wall in the next floor in the semi-prefabricating construction method for a multi-storey building according to the invention.

15 Fig. 13 schematically shows the way of casting the load-bearing cross wall around the side face of the prefabricated outer wall in the semi-prefabricating construction method for a multi-storey building according to the invention.

Fig. 14 schematically shows the entire floor after forming the load-bearing cross wall in the semi-prefabricating construction method for a multi-storey building according to the invention.

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Fig. 15 schematically shows the entire floor after removing the telescopic rod, the triangular support and the wedge in the semi-prefabricating construction method for a multi-storey building according to the invention.

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Preferred Embodiments of the Invention

In the following the invention will be discussed in details with reference to the attached drawings and embodiments so that the objective, technical solution and advantages of the invention are more distinct. It should be understood that the particular embodiments as set forth herewith are intended to be illustrative only, not limiting the scope of the invention in any way.

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35 The semi-prefabricating construction method for a multi-storey building according to the invention is implemented by combining a pre-fabricated element with a cast-in-situ concrete unit together. In other words, the pre-fabricated element is prepared at the building site in advance, then hoisted to the installing site and

connected to the cast-in-situ concrete unit, so as to form the whole floor. To facilitate the connection between the pre-fabricated element and other units to be cast-in-situ later, the pre-fabricated element is provided with some special structures. In the following the pre-fabricated element according to the invention will be discussed in details.

As shown in Figs. 2 to 5, the prefabricated element according to the invention includes a prefabricated outer wall 6 and a prefabricated floor plate 7. The prefabricated outer wall 6 includes a reinforcing concrete (RC) wall 61, in which a window 612 is provided. In addition, the RC wall 61 further includes an upper nut 621 and a lower nut 622 pre-buried at suitable positions respectively in the inner face thereof for temporarily fixing the prefabricated outer wall 6.

As shown in Fig. 2, a recess 611 is provided in each side face of the RC wall 61, and a plurality of exposed reinforcing steel bars 63 are extended therefrom. The plurality of exposed reinforcing steel bars 63 are securely connected to a reinforcement mat of an adjacent cast-in-situ load-bearing cross wall 11 in the same floor, as shown in Fig. 3. Referring to Fig. 2 again, both of the upper and lower end faces of the RC wall 61 have a step-like structure; e.g., in the upper end face the inner side part is higher than the outer side part, while in the lower end face the inner side part is lower than the outer side part. In this manner, the step-like structures of the end faces of two adjacent prefabricated outer walls leads to a shape-complemental fit, as shown in Fig. 5, resulting in a close engagement therebetween. Moreover, cement slurry 12 and water-resistant adhesive 13 can be further poured into the space formed between two engaged end faces of the prefabricated outer walls in two adjacent floors, as shown in Fig. 12, thus enhancing the connection thereof.

As shown in Figs. 4 and 5, the prefabricated floor plate 7 has a rough upper surface, and is further provided with a through hole 71 for temporarily fixing the prefabricated outer wall 6. As the lower portion of a whole floor plate unit, the prefabricated floor plate 7 should be integrated with a cast-in-situ concrete floor plate comprising a reinforcement mat, in order to form a completed semi-prefabricated floor plate 15. During installation the prefabricated floor plate 7 is mounted firstly, and at the same time it also functions as the formwork for the cast-in-situ concrete floor plate placed thereon. Since the prefabricated floor plate 7 needs to be stacked on the cast-in-situ concrete floor plate, the rough upper surface of the prefabricated floor plate 7 is helpful in resisting the horizontal shearing force, increasing the binding force between the cast-in-situ concrete floor plate and the prefabricated floor plate 7.

According to the invention, in the semi-prefabricating construction method for a multi-storey building the pre-fabricated element and the cast-in-situ concrete unit are combined together. During installation, the concrete is cast firstly, then the prefabricated element is connected. As shown in Figs. 5 and 11, during installation of the prefabricated element of the invention, the prefabricated element should be temporarily fixed with some temporary fixing members, and then concrete is cast to form the load-bearing cross wall 11 or the floor plate unit. The temporary fixing members include a telescopic rod 9 and a triangular support 8. Both ends of the telescopic rod 9 and the triangular support 8 are provided with holes. Screw rods can pass through the holes at one end of the telescopic rod 9 and the triangular support 8, and then connect with the upper nut 621 and the lower nut 622 pre-buried in the prefabricated outer wall 6. In addition, screw rods can pass through the holes at the other end of the telescopic rod 9 and the triangular support 8, and then further pass through the through hole 71 in the prefabricated floor plate 7. After that, the prefabricated outer wall 6 can be temporarily secured on the prefabricated floor plate 7 through fastening corresponding nuts. Thereby, a reinforcement mat can be built around the side faces of the prefabricated floor plate 7, and then the load-bearing cross wall is cast. The length of the telescopic rod 9 is adjustable, so that the prefabricated outer wall 6 can be temporarily fixed in the vertical direction with respect to the prefabricated floor plate 7 through adjusting the length of the telescopic rod 9.

In the following, the method for constructing a floor with the above-mentioned prefabricated element according to the invention will be discussed in details:

(1) Placing the prefabricated floor plate 7 on the top of the load-bearing cross walls and the prefabricated outer wall defined therebetween in the next lower floor (as shown in Figs. 6 and 7), wherein the prefabricated floor plate 7 functions as the formwork for the cast-in-situ floor plate during the construction stage, and thus few supporting members are required under the floor plate unit as the formwork.

(2) Laying the floor plate reinforcing steel bars 10 on the prefabricated floor plate 7 (Fig. 8) and casting concrete to form the cast-in-situ concrete floor plate, wherein the prefabricated floor plate 7 and the cast-in-situ concrete floor plate are combined into one piece, forming the semi-prefabricated floor plate 15, as shown in Fig. 9.

Before casting concrete, a conduit is inserted into the through hole 71 of the prefabricated floor plate 7 in advance, ensuring the through hole 71 will not be filled

after concrete is cast. Therefore, the through hole 71 can be used to fix the telescopic rod 9 and the triangular support 8 later. After concrete reaches a certain strength, the conduit can be removed.

- 5 (3) Hoisting the prefabricated outer wall 6 to a target position, temporarily securing the prefabricated outer wall 6 by means of the telescopic rod 9 and the triangular support 8 (Fig. 10), and placing a wedge 17 so as to maintain a suitable space between the prefabricated outer wall 6 and another prefabricated outer wall in the next lower floor, as shown in Fig. 11.

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The wedge 14 can be either inserted from the inner side of the prefabricated outer wall 6 at its bottom part (not shown), or inserted from the outer side of the prefabricated outer wall 6 at its bottom part (Fig. 11). Due to existence of the wedge 14, the weight of the prefabricated outer wall 6 will not be transferred in an accumulative manner, but transferred to the foundation through the load-bearing cross walls 11. The wedge 14 can be removed after casting the load-bearing cross wall 11, or be kept at the bottom part of the wall and then integrated with the cement slurry 12 poured later.

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Referring to Figs. 5 and 11, the method for temporarily securing the prefabricated outer wall 6 includes the following steps:

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Step 1: allowing a suitable first screw rod 64 to pass through the hole at one end of the telescopic rod 9, and connecting the first screw rod 64 to the upper nut 621 pre-buried in the prefabricated outer wall 6;

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Step 2: allowing a suitable second screw rod 65 to pass through the hole at the other end of the telescopic rod 9 and further pass through the through hole 71 in the prefabricated floor plate 7, and then securing the telescopic rod 9 on the semi-prefabricated floor plate 15 with a nut;

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Step 3: allowing a suitable third screw rod 66 to pass through the hole at one end of the triangular support 8, and connecting the third screw rod 66 to the lower nut 622 pre-buried in the prefabricated outer wall 6; and

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Step 4: allowing a suitable fourth screw rod 67 to pass through the hole at the other end of the triangular support 8 and further pass through the through hole 71 in the prefabricated floor plate 7, and then securing the triangular support 8 on the semi-prefabricated floor plate 15 with a nut.

- (4) Adjusting the length of the telescopic rod 9, thus keeping the prefabricated outer wall in the vertical direction with respect to the semi-prefabricated floor plate 15.

(5) Filling the space formed between the prefabricated outer wall 6 and another prefabricated outer wall in the next lower floor with cement slurry 12 and water-resistant adhesive 13 and then carrying out a waterproof treatment, thus closely connecting the prefabricated outer wall 6 and the prefabricated outer wall in the next lower floor, wherein the waterproof treatment includes coating water-resistant adhesive or affixing tapes at the joint area of two prefabricated outer walls adjacent to each other in the vertical direction, as shown in Fig. 12.

(6) Starting from the exposed reinforcing steel bars 63 that extend from the side face 611 of the prefabricated outer wall 6, producing a cross wall reinforcement mat, forming a wall frame, around the prefabricated outer wall 6, and casting concrete in the cross wall reinforcement mat, thus forming the load-bearing cross wall 11, as shown in Fig. 13.

Since the concrete wall of the load-bearing cross wall 11 is cast starting from the edge of the side face 611 of the prefabricated outer wall 6, the step-like structures of both end faces of the prefabricated outer wall 6 will be held and buried between the load-bearing cross walls 11 (Fig. 14), causing a tight combination among the walls.

(7) After the concrete of the load-bearing cross wall 11 reaches a certain strength, removing the triangular support 8 and the telescopic rod 9, which can be reused during casting the upper floor (Fig. 15).

In summary, the semi-prefabricating construction method for a multi-storey building according to the invention can be easily implemented. A standard process can be achieved in construction of a multi-storey building with the above-mentioned steps, ensuring a qualified construction. In addition, the construction efficiency can be increased, the construction period shortened and the cost reduced. It should be understood that as long as the construction quality is ensured, the above steps can be carried out in a different order, or some extra steps can be added. For example, when building the lowest floor, the prefabricated floor plate can be placed directly on a designated horizontal plane; and when building the uppermost floor, an additional prefabricated floor plate can be placed and the cast-in-situ concrete floor plate can be built thereon, both of them being integrated with each other and thus forming the roof unit of the whole building.

In the foregoing a preferred embodiment, not limiting the scope of the invention, is discussed. It is evident that many alternatives and variations will be apparent to those

skilled in the art. Various modifications, changes and improvements may be made without departing from the spirit and scope of the invention as defined in the following claims.

Claims

1. A prefabricated element of a multi-storey building, including a prefabricated outer wall (6), characterized in that,

5 the prefabricated outer wall (6) includes a RC wall (61), each of both side faces of the RC wall (61) having a recess (611) arranged therein, and

a plurality of exposed reinforcing steel bars (63) are extended from both side faces of the RC wall (61), and fixedly connected to a reinforcement mat in an adjacent cast-in-situ load-bearing cross wall (11) in the same floor.

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2. The prefabricated element of a multi-storey building according to claim 1, characterized in that, the upper and lower end faces of the RC wall (61) both have a step-like structure, which forms two parts having different heights, and the step-like structures of the end faces of two prefabricated outer walls (6) of adjacent floors
15 match with each other in a shape-complemental manner.

3. The prefabricated element of a multi-storey building according to claim 2, characterized in that, an upper nut (621) and a lower nut (622) are pre-buried in suitable positions in the inner surface of the RC wall (61) of the prefabricated outer
20 wall (6), in order to fix the prefabricated outer wall (6) temporarily.

4. The prefabricated element of a multi-storey building according to any one of claims 1 to 3, characterized in that, further comprising a prefabricated floor plate (7) having a rough upper surface, wherein a through hole (71) is provided in the
25 prefabricated floor plate (7) for fixing the prefabricated outer wall (6) temporarily.

5. The prefabricated element of a multi-storey building according to claim 4, characterized in that, the prefabricated floor plate (7) functions as the lower portion of a whole floor plate unit, wherein a completed semi-prefabricated floor plate (15) is
30 formed by securingly combining the prefabricated floor plate (7) with a cast-in-situ concrete floor plate containing a reinforcement mat therein, and wherein the prefabricated floor plate (7) is mounted firstly during installation, and it also serves as the formwork for the cast-in-situ concrete floor plate formed thereon.

6. The prefabricated element of a multi-storey building according to any one of claims 1 to 3, characterized in that, a window (612) is arranged in the RC wall (61) of the prefabricated outer wall (6).

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7. A semi-prefabricating construction method for a multi-storey building with use of a prefabricated element including a prefabricated outer wall (6) and a prefabricated floor plate (7), characterized in that, the method comprises the following steps:

5 Step A: placing the prefabricated floor plate (7) on the top of the load-bearing cross walls and the prefabricated outer wall defined therebetween in the next lower floor;

Step B: laying floor plate reinforcing steel bars (10) on the prefabricated floor plate (7) and casting concrete to form a cast-in-situ concrete floor plate, wherein the prefabricated floor plate (7) and the cast-in-situ concrete floor plate are combined into
10 one piece so as to form a semi-prefabricated floor plate (15);

Step C: hoisting the prefabricated outer wall (6) to a target position, and temporarily securing the prefabricated outer wall (6) by means of a telescopic rod (9) and a triangular support (8), so that the prefabricated outer wall (6) is kept in the vertical direction with respect to the semi-prefabricated floor plate (15);

15 Step D: starting from exposed reinforcing steel bars (63) that extend from the side face of the prefabricated outer wall (6), building a cross wall reinforcement mat, which forms a wall frame, around the prefabricated outer wall (6), and casting concrete in the cross wall reinforcement mat so as to form the load-bearing cross wall (11), wherein the prefabricated outer wall (6) are held by at least two load-bearing
20 cross walls (11); and

Repeating Steps A to D to construct the upper floor until the uppermost floor is completed.

25 8. The semi-prefabricating construction method for a multi-storey building according to claim 7, characterized in that, Step B further includes: inserting a conduit into a through hole (71) of the prefabricated floor plate (7) before casting concrete, and removing the conduit after concrete reaches a certain strength.

30 9. The semi-prefabricating construction method for a multi-storey building according to claim 7, characterized in that, Step C specifically includes:

Step C1: allowing a suitable first screw rod (64) to pass through a hole at one end of the telescopic rod (9), and connecting the first screw rod (64) to an upper nut (621) pre-buried in the prefabricated outer wall (6);

Step C2: allowing a suitable second screw rod (65) to pass through a hole at the
35 other end of the telescopic rod (9) and further pass through a through hole (71) in the prefabricated floor plate (7), and then securing the telescopic rod (9) on the semi-prefabricated floor plate (15) with a nut;

Step C3: allowing a suitable third screw rod (66) to pass through a hole at one

end of the triangular support (8), and connecting the third screw rod (66) to a lower nut (622) pre-buried in the prefabricated outer wall (6);

Step C4: allowing a suitable fourth screw rod (67) to pass through a hole at the other end of the triangular support (8) and further pass through a through hole (71) in the prefabricated floor plate (7), and then securing the triangular support (8) on the semi-prefabricated floor plate (15) with a nut;

Step C5: adjusting the length of the telescopic rod (9), thus keeping the prefabricated outer wall in the vertical direction with respect to the semi-prefabricated floor plate (15).

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10. The semi-prefabricating construction method for a multi-storey building according to claim 8, characterized in that, Step C further includes:

when temporarily securing the prefabricated outer wall (6) by means of the telescopic rod (9) and the triangular support (8), placing a wedge (17) either from the inner side or the outer side of the prefabricated outer wall (6) at its bottom, so as to maintain a suitable space between the prefabricated outer wall (6) and another prefabricated outer wall in the next lower floor, wherein cement slurry (12) is poured in the space and a waterproof treatment is carried out, enabling the prefabricated outer wall (6) and the prefabricated outer wall in the next lower floor being tightly connected.

11. The semi-prefabricating construction method for a multi-storey building according to claim 10, characterized in that, the waterproof treatment includes coating water-resistant adhesive or affixing tapes at the joint area of two prefabricated outer walls adjacent to each other in the vertical direction.

12. The semi-prefabricating construction method for a multi-storey building according to claim 10, characterized in that, further including a step after Step D of forming the load-bearing cross wall (11): removing the triangular support (8) and the telescopic rod (9) after the concrete of the load-bearing cross wall (11) reaches a certain strength.