

## **PREFABRICATED KITCHEN AND METHOD FOR CONSTRUCTING AND INSTALLING THE SAME**

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### **Technical Field**

The invention relates to buildings, more specifically to a prefabricated kitchen and a method for constructing and installing the prefabricated kitchen. The invention can be  
10 widely applied in a variety of high-rise buildings.

### **Background**

Kitchen is an essential part of residential houses. Currently there are two ways for  
15 constructing the kitchen. One is to use cast-in-situ concrete at construction sites and then build the kitchen one plate by one plate. This is the most conventional kitchen constructing method widely used, which, however, takes a long construction period with a high construction cost. Moreover, since the building material used may be out of standard, quality of the kitchen thus built cannot be satisfactorily ensured.

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The other way is to prefabricate a whole-set kitchen at factories, and then deliver it to the construction site for installation. This method specifically includes: firstly building a prefabricated kitchen in a place far away from the construction site, and then delivering it to the construction site for use as needed at an appropriate time. Hearth,  
25 supply/drainage pipes and dish sink are casted in the prefabricated kitchen. During installation, it is only required to place the prefabricated kitchen as a whole adjacent to the structural walls onto a predefined floor with a recess, and then fill cement slurry into the joint area. This method for prefabricating a whole-set kitchen, whilst can shorten the construction period and ensure the kitchen having a uniform quality standard, has the following drawbacks: the prefabricated kitchen is placed on the  
30 ground floor directly and is positioned by a simple shape-complementary engagement, so that the kitchen is unstably positioned and thus is easily displaced; further, all of the walls, the bottom plate and the ceiling of the prefabricated kitchen will occupy a certain space in the width and the height directions, so that the space enclosed by the  
35 prefabricated kitchen is less than that of the conventional cast-in-situ kitchen.

### **Summary**

The invention aims to provide a prefabricated kitchen, which can save space and has a

firm structure, and a method for constructing and installing the prefabricated kitchen.

In order to solve the above technical problems, the invention provides a prefabricated kitchen, comprising a bottom unit, four wall units and a ceiling unit that are connected to each other in a securing manner, all of the bottom unit, the four wall units and the ceiling unit being made from reinforced concrete, wherein the wall unit is provided with a window, in which water supply/drainage pipes, wiring pipes and a lighting control box are pre-buried therein, and wherein the prefabricated kitchen is provided with a hearth and a dish sink. At least one of the four wall units is a full-prefabricated structural wall or a semi-prefabricated structural wall, wherein the outer side of the semi-prefabricated structural wall has a rough surface with concave portions and convex portions alternatively arranged, while the full-prefabricated structural wall is provided with a connecting hole extending into the wall from the lower portion of the wall and a grouting hole arranged in the wall surface, and wherein the connecting hole is communicated with the grouting hole and thus a grouting channel is formed.

The connecting hole of the full-prefabricated structural wall abuts in alignment with a connecting hole in the structural wall of adjacent floor, wherein the connecting holes are provided therein with inner steel bars, and the full-prefabricated structural wall forms a unitary body with the structural wall of adjacent floor through pouring cement slurry into the grouting channel and the connecting holes via the grouting hole.

The semi-prefabricated structural wall connects with an outside cast-in-situ structural wall as a unitary body and thus produces a complete structural wall, and the cast-in-situ structural wall is provided therein with an outer wall reinforcement mat, which connects to the exposed prefabricated steel bars of the structural wall in the next floor.

The bottom unit serves as a part of the structural floor plate. At least one edge of the bottom unit is provided with lateral steel bars, which extend outside for a certain distance along the horizontal direction from the inner reinforcement mat and then connect with the steel bars of the abutting structural floor plate in a securing manner.

Temporary securing nuts are provided on the outer surface of one of the four wall units at its lower portion for connecting the wall units of adjacent floor.

A second steel hook for the sake of convenience hoisting is arranged on the upper surface of the ceiling unit, and is hidden within the wall of the ceiling unit and securely connects to the reinforcement mat therein.

The invention further includes a method for constructing a prefabricated kitchen, comprising the following steps:

5       Step A: building a bottom unit and the lower portion of four wall units of the prefabricated kitchen with bottom steel moulds and vertical steel moulds, thus forming a unitary lower half part of the prefabricated kitchen, and allowing the reinforcement mat of the lower half part of the prefabricated kitchen extending a certain distance upwards from the top thereof, thus forming exposed vertical steel bars;

10       Step B: starting from the exposed vertical steel bars extending from the top of the lower half part of the prefabricated kitchen, building reinforcement mats for the upper portion of four wall units and the ceiling unit, casting concrete to build the upper half part of the prefabricated kitchen after mounting an upper inner-side mould and an upper outer-side steel mould, thus enabling the previously-built lower half part of the  
15       prefabricated kitchen and the posteriorly-built upper half part of the prefabricated kitchen being firmly bonded to each other as a unitary body; and

      Step C: mounting a hearth and a dish sink and laying tiles in the prefabricated kitchen.

20       Specifically, Step A includes the followings:

      Step A1: building the profile of the bottom unit and the lower portion of the four wall units by means of bottom steel moulds and vertical steel moulds;

      Step A2: fastening lateral steel bars and vertical steel bars and fixing them within the bottom steel moulds and the vertical steel moulds respectively, then pre-burying a  
25       first steel hook, gas lines for the hearth and water supply/drainage pipes for the dish sink into the bottom steel moulds and the vertical steel moulds respectively, and at the same time firmly connecting the first steel hook with the lateral steel bars; and

      Step A3: pouring suitable concrete into the inner space enclosed by the bottom steel moulds and the vertical steel moulds, and removing the vertical steel moulds  
30       after the concrete reaches a certain strength, thus forming the lower half part of the prefabricated kitchen.

Specifically, Step B includes the followings:

      Step B1: abutting and fixing the structural steel bars forming the profile of the  
35       upper portion of the wall units and the ceiling unit with the exposed vertical steel bars extending from the top of the lower half part of the prefabricated kitchen, thus forming a complete frame of the four wall units and the ceiling unit;

      Step B2: arranging an upper inner-side mould on the inner side of the frame of the four wall units and the ceiling unit, weaving lateral reinforcing steel bars and

vertical reinforcing steel bars at the outer edge of the upper inner-side mould, the lateral reinforcing steel bars and the vertical reinforcing steel bars being connected to the structural steel bars respectively so as to form a reinforcement mat;

5       Step B3: arranging an upper outer-side steel mould on the outer side of the frame of the four wall units and the ceiling unit, keeping the upper outer-side steel mould vertical through an adjusting lever, firmly clamping the reinforcement mat between the upper inner-side mould and the upper outer-side steel mould, and at the same time mounting the cold water pipe, the hot water pipe and the lighting control box at suitable positions; and

10       Step B4: pouring suitable concrete into the inner space enclosed by the upper inner-side mould and the upper outer-side steel mould, removing the upper inner-side mould and the upper outer-side steel mould after the concrete reaches a certain strength, thus forming the upper half part of the prefabricated kitchen.

15       At least one of the four wall units is a semi-prefabricated structural wall or a full-prefabricated structural wall with a bridging structure.

20       When one of the four wall units of the prefabricated kitchen is the full-prefabricated structural wall, Step A1 further includes placing a hollow pipe into one of the vertical steel moulds to contact the bottom steel mould for producing the grouting channel extending into the wall from the lower edge of the wall, and Step A3 further includes removing the hollow pipe after concrete reaches a certain strength.

25       The method further comprises the following step after Step C: arranging two temporary securing nuts on the outer surface of one of the four wall units for temporarily connecting the wall units of adjacent floor during installation of the prefabricated kitchen, and arranging a second steel hook on the ceiling unit, the second steel hook being connected to the structural steel bars.

30       The invention further includes a method for installing a prefabricated kitchen, comprising the steps:

      Step D: leveling out a floor for installing the prefabricated kitchen, and placing a structural floor plate at the edge of the floor;

35       Step E: laying the prefabricated kitchen on the floor and securely connecting the lateral steel bars of the bottom unit of the prefabricated kitchen with the bottom reinforcement mat of the structural floor plate;

      Step F: temporarily fixing the prefabricated kitchen by means of a supporting frame, leaving a gap between the prefabricated kitchen and the floor, and filling cement slurry into the gap;

Step G: casting suitable concrete on the bottom reinforcement mat, thus enabling the bottom unit of the prefabricated kitchen being firmly bonded with the structural floor plate; and

Step H: bridging at least one of the wall units of the prefabricated kitchen with wall units of adjacent floor.

Specifically, Step D includes the followings:

Step D1: defining a floor to be installed with the prefabricated kitchen, and leveling out and cleaning the floor;

Step D2: arranging a supporting base in an adjacent position on the floor; and

Step D3: laying a structural floor plate on the supporting base.

In Step E of the invention, when the prefabricated kitchen is placed on the floor, it can be locked with adjacent floor together by means of temporary securing nuts and a fixing support in order to fix the prefabricated kitchen temporarily.

When the wall unit is the full-prefabricated structural wall, Step H of the invention specifically includes: inserting inner steel bars into the grouting channel of the full-prefabricated structural wall; and pouring cement slurry into the grouting channel through the grouting hole of the full-prefabricated structural wall, thus causing the full-prefabricated structural wall being a unitary body with the structural wall of adjacent floor.

When the wall unit is the semi-prefabricated structural wall, Step H specifically includes: providing steel bars on the outer side of the semi-prefabricated structural wall and connecting them to the exposed prefabricated steel bars on the top of next floor, so as to form an outer wall reinforcement mat; mounting cast-in-situ templates on the outer side of the outer wall reinforcement mat; pouring suitable concrete into the outer wall reinforcement mat being firmly hold, so as to form an in-situ structural wall being firmly bonded to the semi-prefabricated structural wall, thus finally forming a complete structural wall.

After Step H the method further comprises: removing the cast-in-situ templates, the temporary securing nuts, the fixing support, the supporting base and the supporting frame after forming said complete structural outer wall.

Compared with the prior arts, the invention has the following technical advantages:

1) the wall units of the prefabricated kitchen function as the structural walls of buildings or a part thereof, and the bottom unit and the ceiling unit function as a part

of the structural floor plate, thus reducing the inner space of the kitchen occupied by the walls of the prefabricated kitchen and providing a relatively wide inner space; 2) the prefabricated kitchen is constructed at the construction site, so that supervision of the construction quality is conveniently carried out, the product quality is significantly enhanced and the prefabricated kitchen can be hoisted to a desirable site for installation as needed at any appropriate time; and 3) the prefabricated kitchen is formed as a unitary body and the prefabrication by factories can ensure materials of different portions being uniform, thus reducing the risk of cracks generated in the walls due to uneven materials of different portions and contraction/expansion thereof when temperature varies.

### **Brief Description of Drawings**

Fig. 1 schematically shows the whole structure of the prefabricated kitchen according to the invention.

Fig. 2 schematically shows the step of building the bottom unit and the lower half part of the prefabricated kitchen in the constructing method for the prefabricated kitchen according to the invention.

Fig. 3 schematically shows the step of forming the inner grouting channel in the walls in the constructing method for the prefabricated kitchen according to the invention.

Fig. 4 schematically shows the step of connecting lateral and vertical steel bars in the constructing method for the prefabricated kitchen according to the invention.

Fig. 5 schematically shows the step of casting concrete and forming the bottom unit and the lower half part of the prefabricated kitchen in the constructing method for the prefabricated kitchen according to the invention.

Fig. 6 schematically shows the step of removing the steel mould in the constructing method for the prefabricated kitchen according to the invention.

Fig. 7 schematically shows the step of hoisting the lower half part of the prefabricated kitchen in the constructing method for the prefabricated kitchen according to the invention.

Fig. 8 schematically shows the step of building the reinforcement mat of the upper half part of the prefabricated kitchen and the ceiling unit in the constructing method

for the prefabricated kitchen according to the invention.

Fig. 9 schematically shows the step of mounting the upper inner-side aluminium mould in the constructing method for the prefabricated kitchen according to the invention.

Fig. 10 schematically shows the connection way of lateral and vertical reinforcing steel bars in the constructing method for the prefabricated kitchen according to the invention.

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Fig. 11 schematically shows the step of mounting the upper outer-side mounting steel mould in the constructing method for the prefabricated kitchen according to the invention.

Fig. 12 schematically shows the step of casting concrete, forming the upper half part of the prefabricated kitchen and the ceiling unit in the constructing method for the prefabricated kitchen according to the invention.

Fig. 13 schematically shows the step of removing the upper inner-side aluminium mould and the outer-side steel mould in the constructing method for the prefabricated kitchen according to the invention.

Fig. 14 schematically shows the step of mounting the squatting pan or the flush toilet in the constructing method for the prefabricated kitchen according to the invention.

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Fig. 15 schematically shows the bridging structure of the semi-prefabricated structural walls of the prefabricated kitchen according to the invention.

Fig. 16 schematically shows the structures and positions of the bridging structure of the semi-prefabricated structural walls and the exposed steel bars of the prefabricated kitchen according to the invention.

Fig. 17 schematically shows the step of hoisting the prefabricated kitchen through a hanger according to the invention through a hoisting beam.

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Fig. 18 schematically shows the step of defining the installation position (floor) and disposing a supporting frame in the installing method for the prefabricated kitchen according to the invention.

Fig. 19 schematically shows the step of building a supporting base in the installing method for the prefabricated kitchen according to the invention.

Fig. 20 schematically shows the step of laying the structural floor plates in the installing method for the prefabricated kitchen according to the invention.

Fig. 21 schematically shows the step of mounting the bottom reinforcement mat in the installing method for the prefabricated kitchen according to the invention.

Fig. 22 schematically shows the connection of the lateral steel bars of the bottom unit in the installing method for the prefabricated kitchen according to the invention.

Fig. 23 schematically shows the step of casting concrete and integrating the bottom unit with the structural floor plate in the installing method for the prefabricated kitchen according to the invention.

Fig. 24 schematically shows the position relationship of the grouting holes in the full-prefabricated structural walls of the prefabricated kitchen according to the invention.

Fig. 25 schematically shows the connection way of the full-prefabricated structural walls in the installing method of the prefabricated kitchen according to the invention.

Fig. 26 schematically shows the step of forming an outer wall reinforcement mat in the installing method for the prefabricated kitchen according to the invention.

Fig. 27 schematically shows the step of building the cast-in-situ templates and the outer wall reinforcement mat in the installing method for the prefabricated kitchen according to the invention.

Fig. 28 schematically shows the step of removing the support base and the support frame and in the installing method for the prefabricated kitchen according to the invention.

## **Preferred Embodiments of the Invention**

In the following the invention will be discussed in details with reference to the attached drawings and embodiments in order to enable the objective, technical solution and advantages of the invention being more distinct. It should be understood

that the particular embodiments as set forth herewith are intended to be illustrative, not to limit the scope of the invention in any way.

As shown in Figs. 1, 22 and 27, the prefabricated kitchen according to the invention comprises a bottom unit 11, four wall units 12 and a ceiling unit 13 that are connected to each other in a securing manner. The bottom unit 11, four wall units 12 and the ceiling unit 13 are all made from reinforced concrete (RC). The wall unit 12 is provided with a window, in which water supply/drainage pipes, wiring pipes and a lighting control box are pre-buried therein. The prefabricated kitchen is provided with a hearth 37 and a dish sink 44 (Fig. 14). The above technical features of the prefabricated kitchen are generally the same as those in the prior arts. The prefabricated kitchen according to the invention differs from that in the prior arts as follows:

At least one of the four wall units 12 serves as a structural wall of the building, or a part thereof. According to the invention, the wall unit is referred to as full-prefabricated structural wall 121 when used as the structural wall of the building (see Fig. 25), and as semi-prefabricated structural wall 122 when used as a part of the structural wall of the building. The semi-prefabricated structural wall 122 has to be combined with part of a cast-in-situ structural wall for forming a complete structural wall (see Fig. 27). Both of the full-prefabricated structural wall 121 and the semi-prefabricated structural wall 122 are provided with bridging structures securely connected with abutting structural walls. One skilled in the art can be able to determine whether the prefabricated kitchen is provided with the full-prefabricated structural wall or the semi-prefabricated structural wall and which of the walls should be designed as the structural wall, based on the load received by the walls of the buildings.

The bottom unit 11 serves as a part of the structural floor plate. At least one edge of the bottom unit 11 is provided with lateral steel bars 18 (see Fig. 22), which extend outside for a certain distance along the horizontal direction and connect with the steel bars of the abutting floor plate in a securing manner. That is to say, in the embodiment of the invention, through connecting the lateral steel bars 18 extending from the edge of the bottom unit 11 of the kitchen with the steel bars of the structural floor plate located at the outer edge thereof and casting concrete thereon, the bottom unit 11 can form a unitary body with the structural floor plate. Therefore, the bottom unit 11 of the kitchen is of good quality and a firm bond, with little displacement.

As shown in Fig. 25, the bridging structure of the full-prefabricated structural wall

121 includes a connecting hole 1211 extending into the wall from the lower edge of the wall and a grouting hole 1212 arranged on the wall surface, wherein the connecting hole 1211 is communicated with the grouting hole 1212 and thus a grouting channel 1214 is formed. The connecting hole 1211 abuts in alignment with the connecting hole in the structural wall of adjacent floor. The grouting channel 1214 and the abutted connecting hole are provided therein with inner steel bars 38. By means of pouring cement slurry into the grouting channel 1214 and the abutted connecting hole through the grouting hole 1212, the full-prefabricated structural wall 121 and the structural wall of adjacent floor can be formed in a unitary body together.

As shown in Fig. 15, the outer side of the semi-prefabricated structural wall 122, having a rough outer surface with concave and convex portions alternatively arranged, is thinner than the whole structural wall of the buildings. The rough outer surface with concave and convex portions alternatively arranged is used as the bridging structure of the semi-prefabricated structural wall 122, which connects to the outside cast-in-situ structural wall so as to form a unitary body, thus producing a complete structural wall. As shown in Figs. 26 and 27, the cast-in-situ structural wall is provided therein with an outer wall reinforcement mat 43, which connects to the exposed prefabricated steel bars 39 of the structural wall in the next floor.

As shown in Figs. 4 and 12, a first steel hook 141 and a second hook 142 are arranged on the upper surfaces of the bottom unit 11 and the ceiling unit 13 respectively for the sake of convenience hoisting. The second hook is hidden within the wall of the bottom unit 11 and the ceiling unit 13, and securely connects to the lateral steel bars 18.

In the following the constructing method of the prefabricated kitchen according to the invention will be discussed with the full-prefabricated structural wall as example. As shown in Figs. 2-16, the constructing method includes the following steps:

- 1) Building the bottom unit 11 and the lower half part of the four wall units 12 of the prefabricated kitchen by means of bottom steel moulds 16 and vertical steel moulds 17 (Fig. 2);
- 2) Placing a hollow pipe 31 into one of the vertical steel moulds 17 to contact the bottom steel mould 16 for producing the grouting channel 1214 extending into the wall inside from the lower edge of the wall (Fig. 3);
- 3) Fastening the lateral steel bars 18 and the vertical steel bars 19 and fixing them

into the bottom steel moulds 16 and vertical steel moulds 17 respectively, then pre-burying the first steel hook 141, gas lines for the hearth and the water supply/drainage pipes 15 for the dish sink 44 within the bottom steel moulds 16 and vertical steel moulds 17 respectively, and at the same time firmly connecting the first steel hook 141 and the lateral steel bars 18 (Fig. 4);

4) Pouring suitable concrete into the inner space enclosed by the bottom steel moulds 16 and the vertical steel moulds 17 (Fig. 5);

5) Removing the vertical steel moulds 17 and the hollow pipe 31 after the concrete reaches a certain strength, thus forming the bottom unit 11 of the prefabricated kitchen and the lower half part 51 of the prefabricated kitchen (Fig. 6);

6) Hoisting the bottom unit 11 and the lower half part 51 of the prefabricated kitchen obtained from the above steps to another construction site for constructing the upper half part 52 and the ceiling unit 13 of the prefabricated kitchen (Fig. 7). Of course, the upper half part 52 and the ceiling unit 13 of the prefabricated kitchen can be also constructed in one single construction site. Therefore, this step 6) may be unnecessary;

7) Abutting the structural steel bars 32 forming the profile of the upper half part of the wall units 12 and the ceiling unit 13 with the exposed vertical steel bars extending from the top of the lower half part 51 of the prefabricated kitchen, thus forming a complete frame of the four wall units 12 and the ceiling unit 13 (Fig. 8);

8) Arranging an upper inner-side aluminum mould 20 on the inner side of the frame formed by the four wall units 12 and the ceiling unit 13 (Fig. 9);

9) Weaving lateral reinforcing steel bars 21 and vertical reinforcing steel bars 22 on the outer edge of the upper inner-side aluminum mould 20, the lateral reinforcing steel bars 21 and the vertical reinforcing steel bars 22 being connected to the structural steel bars 32 respectively so as to form a reinforcement mat (Fig. 10);

10) Arranging an upper outer-side steel mould 23 outside the frame formed by the four wall units 12 and the ceiling unit 13, keeping the second steel mould 23 being vertical through an adjusting lever 35, and firmly clamping the reinforcement mat between the upper inner-side aluminum mould 20 and the upper outer-side steel mould 23 (Fig. 11);

11) Mounting the cold water pipe 33, the hot water pipe 34 and the lighting control box 36 at suitable positions on the frame of the four wall units 12, connecting the out edge of the second steel hook 142 that is buried into the upper inner-side aluminum mould 20 with the structural steel bars 32, and then pouring desirable concrete into the inner space enclosed by the first steel mould 20 and the second steel mould 23 (Fig. 12);

12) Removing the upper inner-side aluminum mould 20 and the upper outer-side steel mould 23 after the concrete reaches a certain strength, thus forming the upper half part 52 of the prefabricated kitchen (Fig. 13);

13) Mounting the hearth 37 and the dish sink 44 and laying tiles 41 in the prefabricated kitchen (Fig. 14).

Through the above-mentioned steps the prefabricated kitchen according to the invention can be built, the four wall units obtained all being full-prefabricated structural walls. The building method of the semi-prefabricated structural walls is substantially similar to that of the full-prefabricated structural walls, except that no arrangement and removal of the hollow pipe 31 is necessary when constructing the semi-prefabricated structural walls, i.e., no grouting channel 1214 is needed; rather, it is only necessary to enable the wall units of the semi-prefabricated structural walls having rough surfaces with concave and convex portions arranged alternatively through a special designed mould.

In the embodiment of the invention, in order to facilitate hoisting of the prefabricated kitchen produced, on the ceiling unit 13 of the prefabricated kitchen a second steel hook 142 is provided, which is connected to the structural steel bars 32. Therefore, through a hanger 40 engaging with the second steel hook 142 (as shown in Fig. 17), the prefabricated kitchen can be hoisted and thus delivered to any destination for installation. Moreover, according to the invention, the outer surface of one of the four wall units 12 is provided with two temporary securing nuts 24 for temporarily connecting the wall units of vertically adjacent floor during installation of the prefabricated kitchen, so that a safe and close connection between the vertically adjacent floor can be further ensured.

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In the following the installation method of the prefabricated kitchen according to the invention will be discussed. The installation method is shown in Figs. 18 to 23, comprising the steps:

- 1) Defining a floor 25 to be installed with the prefabricated kitchen, leveling out and cleaning the floor 25 (Fig. 18);
- 2) Arranging a supporting base 29 in an adjacent position on the floor 25 (Fig. 19);
- 3) Laying a structural floor plate 26 on the supporting base 29 (Fig. 20);
- 4) Mounting a bottom reinforcement mat 42 on the structural floor plate 26 (Fig. 21);
- 5) Placing the prefabricated kitchen on the floor 25, then temporarily locking the prefabricated kitchen and the adjacent floor together by means of temporary securing nuts 24 and a fixing support 30 (Fig. 16), and securely connecting the lateral steel bars 18 of the bottom unit of the prefabricated kitchen with the bottom reinforcement mat 42 (Fig. 22);
- 6) Temporarily fixing the prefabricated kitchen by means of the supporting frame 28, leaving a gap, which is at least 10mm, between the prefabricated kitchen and the floor 25, and filling cement slurry into the gap (Fig. 22);
- 7) Casting desirable concrete on the bottom reinforcement mat 42, thus enabling the bottom unit 11 of the prefabricated kitchen being firmly bonded with the structural floor plate 26 (Fig. 23).

Through the above steps the bottom unit 11 of the prefabricated kitchen can be installed and fixed. In the following the installation method for the wall units of the prefabricated kitchen according to the invention will be explained with the full-prefabricated structural walls 121 and the semi-prefabricated structural walls 122 as examples.

When the wall units use the full-prefabricated structural wall 121, the installation method includes: inserting inner steel bars 38 into the grouting channel 1214 of the full-prefabricated structural wall 121; pouring cement slurry into the grouting channel 1214 through the grouting hole 1212 of the full-prefabricated structural wall 121 (Figs. 24 and 25), thus causing the full-prefabricated structural wall 121 being a unitary body with the structural wall of adjacent floor.

When the wall units use the semi-prefabricated structural wall 122, the installation method includes, as shown in Figs. 26 to 27: starting from the exposed prefabricated steel bars 39 on the top of the structural wall in the lower floor with respect to the

semi-prefabricated structural wall 122, providing steel bars in the upward direction outside of the semi-prefabricated structural wall 122 and connecting them to the exposed prefabricated steel bars 39, so as to form the outer wall reinforcement mat 43 (Fig. 26); installing the cast-in-situ templates 1223 on the outer side of the outer wall reinforcement mat 43 (Fig. 27); then, pouring desirable concrete into the outer wall reinforcement mat 43 being fixed so as to form an in-situ structural wall, which is firmly bonded to the semi-prefabricated structural wall 122, thus forming a complete structural wall; finally, after forming the complete structural wall, removing the cast-in-situ templates 1223, and removing the temporary securing nuts 24 and the fixing support 30 for reuse when building the next floor (Fig. 28).

While the invention has been described in conjunction with the preferred embodiments outlined above, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Various changes may be made without departing from the spirit and scope of the invention as defined in the following claims.

## Claims

1. A prefabricated kitchen, comprising a bottom unit (11), four wall units (12) and a ceiling unit (13) that are connected to each other in a securing manner, all of the  
5 bottom unit (11), the four wall units (12) and the ceiling unit (13) being made from reinforced concrete, wherein the wall unit (12) is provided with a window, in which water supply/drainage pipes, wiring pipes and a lighting control box are pre-buried therein, and wherein the prefabricated kitchen is provided with a hearth (37) and a dish sink (44),

10 characterizing in that, at least one of the four wall units (12) is a full-prefabricated structural wall (121) or a semi-prefabricated structural wall (122), wherein the outer side of the semi-prefabricated structural wall (122) has a rough surface with concave portions and convex portions alternatively arranged, while the full-prefabricated structural wall (121) is provided with a connecting hole (1211)  
15 extending into the wall from the lower portion of the wall and a grouting hole (1212) arranged in the wall surface, and the connecting hole (1211) is communicated with the grouting hole (1212) and thus a grouting channel (1214) is formed.

2. The prefabricated kitchen according to claim 1, characterizing in that, the  
20 connecting hole (1211) of the full-prefabricated structural wall (121) abuts in alignment with a connecting hole in the structural wall of adjacent floor, wherein the connecting holes are provided therein with inner steel bars (38), and the full-prefabricated structural wall (121) forms a unitary body with the structural wall of adjacent floor through pouring cement slurry into the grouting channel (1214) and the  
25 connecting holes via the grouting hole (1212).

3. The prefabricated kitchen according to claim 1, characterizing in that, the semi-prefabricated structural wall (122) connects with an outside cast-in-situ structural wall as a unitary body to produce a complete structural wall, and the  
30 cast-in-situ structural wall is provided therein with an outer wall reinforcement mat (43), which connects to the exposed prefabricated steel bars (39) of the structural wall in the next floor.

4. The prefabricated kitchen according to any one of claims 1 to 3, characterizing  
35 in that, the bottom unit (11) serves as a part of the structural floor plate, and at least one edge of the bottom unit (11) is provided with lateral steel bars (18), which extend outside from an inner reinforcement mat for a certain distance along the horizontal direction and then connect with the steel bars of the abutting structural floor plate in a secure manner.

5. The prefabricated kitchen according to claim 4, characterizing in that, a second steel hook (142) for the sake of convenient hoisting is arranged on the upper surface of the ceiling unit (13), and is hidden within the wall of the ceiling unit (13) and  
5 securely connects to the reinforcement mat therein.

6. A method for constructing a prefabricated kitchen, comprising the following steps:

Step A: building a bottom unit (11) and the lower portion of four wall units (12)  
10 of the prefabricated kitchen with bottom steel moulds (16) and vertical steel moulds (17), thus forming a unitary lower half part (51) of the prefabricated kitchen, and allowing a reinforcement mat of the lower half part (51) of the prefabricated kitchen to extend a certain distance upwards from the top thereof, thus forming exposed vertical steel bars;

15 Step B: starting from the exposed vertical steel bars extending from the top of the lower half part (51) of the prefabricated kitchen, building reinforcement mats for the upper portion of four wall units (12) and the ceiling unit (13), casting concrete to build the upper half part (52) of the prefabricated kitchen after mounting an upper inner-side mould (20) and an upper outer-side steel mould (23), thus enabling the  
20 previously-built lower half part (51) of the prefabricated kitchen and the posteriorly-built upper half part (52) of the prefabricated kitchen being firmly bonded as a unitary body; and

Step C: mounting a hearth (37) and a dish sink (44) and then laying tiles (41) in the prefabricated kitchen.

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7. The method for constructing a prefabricated kitchen according to claim 6, characterizing in that, Step A specifically includes the followings:

Step A1: building the profile of the bottom unit (11) and the lower portion of the four wall units (12) by means of bottom steel moulds (16) and vertical steel moulds  
30 (17);

Step A2: fastening lateral steel bars (18) and vertical steel bars (19) and fixing them within the bottom steel moulds (16) and the vertical steel moulds (17) respectively, then pre-burying a first steel hook (141), gas lines for the hearth (37) and water supply/drainage pipes (15) for the dish sink (44) into the bottom steel moulds  
35 (16) and the vertical steel moulds (17) respectively, and at the same time firmly connecting the first steel hook (141) with the lateral steel bars (18); and

Step A3: pouring suitable concrete into the inner space enclosed by the bottom steel moulds (16) and the vertical steel moulds (17), and removing the vertical steel moulds (17) after the concrete reaches a certain strength, thus forming the lower half

part (51) of the prefabricated kitchen.

8. The method for constructing a prefabricated kitchen according to claim 6, characterizing in that, Step B specifically includes the followings:

5       Step B1: abutting and fixing the structural steel bars (32) forming the profile of the upper portion of the four wall units (12) and the ceiling unit (13) with the exposed vertical steel bars extending from the top of the lower half part (51) of the prefabricated kitchen, thus forming a complete frame of the four wall units (12) and the ceiling unit (13);

10       Step B2: arranging an upper inner-side mould (20) on the inner side of the frame of the four wall units (12) and the ceiling unit (13), weaving lateral reinforcing steel bars (21) and vertical reinforcing steel bars (22) on the outer edge of the upper inner-side mould (20), the lateral reinforcing steel bars (21) and the vertical reinforcing steel bars (22) being connected to the structural steel bars (32)  
15       respectively so as to form a reinforcement mat;

      Step B3: arranging an upper outer-side steel mould (23) on the outer side of the frame of the four wall units (12) and the ceiling unit (13), keeping the upper outer-side steel mould (23) vertical through an adjusting lever (35), firmly clamping the reinforcement mat between the upper inner-side mould (20) and the upper  
20       outer-side steel mould (23), and at the same time mounting the cold water pipe (33), the hot water pipe (34) and the lighting control box (36) at suitable positions; and

      Step B4: pouring suitable concrete into the inner space enclosed by the upper inner-side mould (20) and the upper outer-side steel mould (23), removing the upper inner-side mould (20) and the upper outer-side steel mould (23) after the concrete  
25       reaches a certain strength, thus forming the upper half part (52) of the prefabricated kitchen.

9. The method for constructing a prefabricated kitchen according to claim 7, characterizing in that, at least one of the four wall units (12) is a semi-prefabricated  
30       structural wall (122) or a full-prefabricated structural wall (121).

10. The method for constructing a prefabricated kitchen according to claim 9, characterizing in that, when one of the four wall units (12) of the prefabricated kitchen is the full-prefabricated structural wall, Step A1 further includes placing a hollow pipe  
35       (31) into one of the vertical steel moulds (17) to contact the bottom steel mould (16) for producing a grouting channel (1214) extending into the wall from the lower edge of the wall, and Step A3 further includes removing the hollow pipe (31) after concrete reaches a certain strength.

11. The method for constructing a prefabricated kitchen according to any one of claims 7 to 10, characterizing in that, further comprising the following steps after Step C:

5 arranging two temporary securing nuts (24) on the outer surface of one of the four wall units (12) for temporarily connecting the wall units of adjacent floor during installation of the prefabricated kitchen, and arranging a second steel hook (142) on the ceiling unit (13), the second steel hook (142) being connected to the structural steel bars (32).

10 12. A method for installing a prefabricated kitchen, comprising the steps:

Step D: leveling out a floor (25) for installing the prefabricated kitchen, and placing a structural floor plate (26) at the edge of the floor (25);

15 Step E: laying the prefabricated kitchen on the floor (25) and securely connecting the lateral steel bars (18) of the bottom unit of the prefabricated kitchen with the bottom reinforcement mat (42) of the structural floor plate (26);

Step F: temporarily fixing the prefabricated kitchen by means of a supporting frame (28), leaving a gap between the prefabricated kitchen and the floor (25), and filling cement slurry into the gap; and

20 Step G: casting suitable concrete on the bottom reinforcement mat (42), thus enabling the bottom unit (11) of the prefabricated kitchen being firmly bonded with the structural floor plate (26); and

Step H: bridging at least one of the wall units (12) of the prefabricated kitchen with wall units of adjacent floor.

25 13. The method for installing a prefabricated kitchen according to claim 12, characterizing in that, Step D specifically includes the followings:

Step D1: defining a floor (25) to be installed with the prefabricated kitchen, and leveling out and cleaning the floor (25);

30 Step D2: arranging a supporting base (29) in an adjacent position on the floor (25); and

Step D3: laying a structural floor plate (26) on the supporting base (29).

14. The method for installing a prefabricated kitchen according to claim 12 or 13, characterizing in that, in Step E, when the prefabricated kitchen is placed on the floor (25), it can be locked with adjacent floor together by means of temporary securing nuts (24) and a fixing support (30) in order to fix the prefabricated kitchen temporarily.

15. The method for installing a prefabricated kitchen according to claim 12 or 13,

characterizing in that, when the wall unit is the full-prefabricated structural wall (121), Step H specifically includes the followings:

inserting inner steel bars (38) into the grouting channel (1214) of the full-prefabricated structural wall (121); and

5       pouring cement slurry into the grouting channel (1214) through the grouting hole (1212) of the full-prefabricated structural wall (121), thus causing the full-prefabricated structural wall (121) being a unitary body with the structural wall of adjacent floor.

10       16. The method for installing a prefabricated kitchen according to claim 12 or 13, characterizing in that, when the wall unit is the semi-prefabricated structural wall (122), Step H specifically includes the followings:

providing steel bars on the outer side of the semi-prefabricated structural wall (122) and connecting them to the exposed prefabricated steel bars (39) on the top of structural wall of next floor, so as to form an outer wall reinforcement mat (43);

15       mounting cast-in-situ templates (1223) on the outer side of the outer wall reinforcement mat (43);

pouring suitable concrete into the outer wall reinforcement mat (43) being firmly held, so as to form an in-situ structural wall, which is firmly bonded to the semi-prefabricated structural wall (122) to form a complete structural wall.

20       17. The method for installing a prefabricated kitchen according to claim 16, characterizing in that, after Step H the method further comprises:

removing the cast-in-situ templates (1223), the temporary securing nuts (24), the fixing support (30), the supporting base (29) and the supporting frame (28) after forming said complete structural outer wall.