**AMENDED CLAIMS**

1. A rooftop elevator engine room, comprising an engine room unit (1), and a cast-in-situ load-bearing structure (2) supporting the engine room unit (1) from below,

characterizing in that the engine room unit (1) is formed by connecting a plurality of prefabricated components together, each of which is formed as an integrally modular structure including a wall body and a top plate;

a lower portion of the wall body of each prefabricated component is provided in advance with a later-pouring zone (11), into which exposed reinforcing bars of the wall body and of the cast-in-situ load-bearing structure (2) all extend, wherein the exposed reinforcing bars of the wall body and those of the cast-in-situ load-bearing structure (2) are connected together, and said prefabricated component and the cast-in-situ load-bearing structure (2) arranged therebelow are connected to each other through pouring concrete in the later-pouring zone (11); and

an outer surface of the wall body of each prefabricated component is provided with a first recess at a connecting side thereof, and an outer surface of the top plate of the prefabricated component is provided with a second recess at the connecting side, wherein the wall body and the top plate are respectively provided with exposed reinforcing bars, which extend into the first and second recesses respectively, the exposed reinforcing bars in the first and second recesses of two adjacent prefabricated components being connected with each other, so that said adjacent prefabricated components are connected to each other through pouring concrete in the first and second recesses.

2. The rooftop elevator engine room according to claim 1, characterizing in that the later-pouring zone (11) is an inner concave zone formed on an outer side surface or an inner side surface of the wall body of the prefabricated component at the lower portion thereof, and the wall body has a thickness of 90-120 mm at the later-pouring zone (11).

3. The rooftop elevator engine room according to claim 1, characterizing in that the first recess and the second recess at the connecting side of the prefabricated component extend throughout the connecting sides of the wall body and the top plate

of said prefabricated component respectively, each of the first recess and the second recess having a width of 300-500 mm.

4. The rooftop elevator engine room according to claim 3, characterizing in that an outer edge of each of the first and second recesses is provided with a slope, which extends gradually downward and outward.

5. The rooftop elevator engine room according to any one of claims 1 to 4, characterizing in that the cast-in-situ load-bearing structure (2) includes a cast-in-situ load-bearing wall (21) higher than a floor of the rooftop.

6. A method for constructing the rooftop elevator engine room of claim 1, comprising the following steps:

A) completing the cast-in-situ load-bearing structure (2) below the elevator engine room at a construction site, the cast-in-situ load-bearing structure (2) being provided at its top with exposed reinforcing bars;

B) hoisting the prefabricated components of the engine room unit (1) to respectively designated positions above the cast-in-situ load-bearing structure (2), with mounting fittings being used for temporary support;

C) binding reinforcing bars in the later-pouring zone (11) at the lower portion of the wall body of each prefabricated component, and connecting the exposed reinforcing bars at the lower portion of the wall body with the exposed reinforcing bars at the top of the cast-in-situ load-bearing structure (2) arranged therebelow;

D) binding reinforcing bars in the first and second recesses at the connecting sides of the wall body and the top plate of each prefabricated component, and connecting the exposed reinforcing bars at both sides of the connecting side together;

E) pouring concrete, after outer templates are installed, in the later-pouring zone (11), the first recess at the connecting side of the wall body, and the second recess at the connecting side of the top plate of each prefabricated component; and

F) removing the outer templates and the mounting fittings after the concrete in the later-pouring zone (11) and in the first and second recesses reaches its designed age.

7. The method for constructing the rooftop elevator engine room according to claim 6, characterizing in that it further comprises producing each prefabricated component as a whole by an iron mold before step B).

8. The method for constructing the rooftop elevator engine room according to claim 7, characterizing in that when being produced, the prefabricated component is installed with ceiling beams, doors and windows.

9. The method for constructing the rooftop elevator engine room according to any one of claims 6 to 8, characterizing in that in step A), a cast-in-situ load-bearing wall (21) higher than the rooftop floor (3) is poured under the engine room unit (1).