

PREFABRICATED INTEGRATED BATHROOM AND CONSTRUCTION METHOD THEREOF

TECHNICAL FIELD

The present disclosure relates to the field of buildings and more particularly to a prefabricated integrated bathroom and a construction method thereof.

BACKGROUND

At present, conventional integrated bathrooms used in the building field may include an integrated bathroom formed with a fiberglass-reinforced plastic composite material through compression molding and an integrated bathroom prefabricated with reinforced concrete. The integrated bathroom formed with a fiberglass-reinforced plastic composite material through compression molding may have major defects such as poor fireproofing performance, poor sound insulation effect and inability of a user to change sanitary fittings and facilities therein. However, the integrated bathroom prefabricated with a concrete material may have a major defect of large dead-weight, for example, its dead weight may be up to 8-12 tons and therefore the bathroom can not be hoisted by a tower crane.

SUMMARY

The present disclosure is intended to overcome the defects of the prior art by providing a prefabricated integrated bathroom which is prefabricated simply and quickly with foam cement composite boards on a mass production scale and a construction method thereof. The integrated bathroom disclosed in the present disclosure is an energy-saving, environment-friendly green building featuring light weight, weight bearing, heat preservation, heat insulation, durability, earthquake resistance, excellent fireproof performance, and excellent sound insulation performance.

A technical solution of the present disclosure is as follows.

A prefabricated integrated bathroom may include a foam cement composite bottom board, a foam cement composite wall board, a foam cement composite top board and bathroom equipment, where a dovetail groove type steel frame boundary rib is respectively arranged in each of the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board; the dovetail groove type steel frame boundary rib may include upper and lower flanges and a dovetail groove type boundary rib groove; and an embedded component, for example, a wedge block, may be arranged in the groove.

The connection between the foam cement composite wall board and the foam cement composite bottom board may be carried out by connecting bolts, a connecting piece and wedge blocks arranged in the grooves of the dovetail groove type boundary ribs of the boards.

The connection between the foam cement composite wall boards may be carried out by connecting bolts, a connecting piece and the wedge blocks arranged in the grooves of the dovetail groove type boundary ribs of the boards.

The connection between the foam cement composite wall board and the foam cement composite top board may be carried out by connecting the bolts, the connecting piece and the wedge blocks arranged in the grooves of the dovetail groove type boundary ribs of the boards.

The foam cement composite bottom board is composited with a steel frame, a reinforcement truss, a steel wire mesh, an inorganic foam cement core material and upper and lower cement mortar surface layers, where the steel wire mesh is connected and fixed to the steel frame, and also the steel wire mesh may be entirely or partially paved according to a design requirement. Water drainage pipe fittings including a drain pipe, and a floor drain and the like may be arranged in the foam cement composite bottom board.

The foam cement composite wall board is composited with a steel frame, upper and lower steel wire meshes, a plurality of steel rings tied to the upper and lower steel wire meshes, an inorganic foam cement core material and upper and lower cement mortar surface layers, where the steel wire mesh is connected and fixed to the steel frame, and also the steel wire mesh may be entirely or partially paved according to a design requirement. A water supply pipe, a water supply connector, a drain hole for pedestal pan, a concealed switch box and a wire pipe may be arranged in the foam cement composite wall board, and also a door hole and a window hole may be arranged in the composite wall board.

The foam cement composite wall board may be of another structure. For example, the foam cement composite wall board is composited with a steel frame, a steel wire mesh, a reinforcement truss, an inorganic foam cement core material and upper and lower cement mortar surface layers, where the steel wire mesh is connected and fixed to the steel frame, and also the steel wire mesh may be entirely or partially paved according to a design requirement. A water supply pipe, a water supply connector, a drain hole for pedestal pan, a concealed switch box and a wire pipe may be arranged in the foam cement composite wall board, and also a door hole and a window hole may be arranged in the composite wall board.

The foam cement composite top board is composited with a steel frame, a steel wire mesh, a reinforcement truss, an inorganic foam cement core material and upper and lower cement mortar surface layers, where the steel wire mesh is connected and fixed to the steel frame, and also the steel wire mesh may be entirely or partially paved according to a design requirement. A concealed lamp holder box and a pipeline may be arranged in the foam cement composite top board, and also a ventilation hole and an access hole may be arranged in the foam cement composite top board.

The wedge block arranged in the groove of the dovetail groove type boundary rib is slidable so that it can be installed quickly at a correct position.

The wedge block is matched in shape with the groove.

The wedge block may be pre-placed in the groove of the dovetail groove type boundary rib, or placed in the groove of the dovetail groove type boundary rib during installation.

The wedge block includes a hole matched with a bolt, and a slot for placing a nut .

According to another structure of the wedge block, the wedge block includes a threaded hole matched with a bolt .

The connecting piece is of right angle, and has a via hole matched with a bolt.

An internal surface and an external surface of the prefabricated integrated bathroom may be decorated with different ornaments and decoration materials so as to meet decoration requirements for different styles of bathrooms.

Bathroom waterproofing may be performed in the prefabricated integrated bathroom by using different coating-type or roll-type waterproof materials to meet different bathroom waterproofing requirements.

A construction method of a prefabricated integrated bathroom may include the steps of:

performing industrialized custom production for a foam cement composite bottom board, a foam cement composite wall board and a foam cement composite top board according to an actual requirement of a customer and prefabricating water supply pipe fittings, water drainage pipe fittings, electric devices and a door hole, a window hole and the like in the foam cement composite boards according to a design requirement; assembling the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board accurately and quickly in such a way as building blocks and connecting and fixing them in a mechanical manner; installing bathroom equipment to construct an integrated bathroom; transporting the integrated bathroom to a construction site; and installing the integrated bathroom in place using a hoisting crane.

Waterproofing and internal and external decorations may be completed for the integrated bathroom in a factory as required.

The bathroom equipment arranged in the integrated bathroom may also be installed at a construction site.

A construction method of a prefabricated integrated bathroom may include the steps of:

Step A: manufacturing a foam cement composite bottom board, a foam cement composite wall board and a foam cement composite top board according to a design requirement, where a dovetail groove type steel frame boundary rib is arranged in each of the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board; the dovetail groove type steel frame boundary rib includes upper and lower flanges and a dovetail groove type boundary rib groove; and an embedded component, for example, a wedge block, is arranged in the dovetail groove type boundary rib groove;

Step B: connecting the foam cement composite bottom board with the foam cement composite wall board;

first, placing the foam cement composite bottom board on a horizontal base plane, then vertically placing the foam cement composite wall board at a corresponding position of the foam cement composite bottom board according to a design requirement; placing a wedge block in which a nut is placed in the groove of the dovetail groove type boundary rib arranged in each of the foam cement composite bottom board and the foam cement composite wall board; then running bolts through a connecting piece and

connecting and fixing the bolts to the nuts in the wedge blocks so as to connect and fix the foam cement composite bottom board with the foam cement composite wall board by fastening the wedge blocks with the dovetail groove type steel frame boundary ribs; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite bottom board respectively in the same way;

Step C: connecting the foam cement composite wall board with the foam cement composite wall board;

first, vertically placing a second foam cement composite wall board at a corresponding position of the foam cement composite bottom board, adjusting the position of the second wall board relative to a first wall board, and connecting the second foam cement composite wall board with the foam cement composite bottom board in the way described in step B;

then, connecting the first wall board with the second wall board: placing the a wedge block in which a nut is placed in the groove of the dovetail groove type boundary rib arranged in each of the foam cement composite wall boards, running bolts through a connecting piece respectively, and connecting and fixing the bolts to the nuts in the wedge blocks so as to connect the two foam cement composite wall boards by fastening the wedge blocks with the dovetail groove type steel frame boundary ribs; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

Step D: connecting the foam cement composite wall board with the foam cement composite top board;

first, placing the foam cement composite top board on the foam cement composite wall board, placing a wedge block in which a nut is placed in the groove of the dovetail groove type boundary rib arranged in each of the foam cement composite top board and the foam cement composite wall board, then running bolts through a connecting piece respectively, and connecting and fixing the bolts to the nuts in the wedge blocks so as to connect the foam cement composite wall board with the foam cement composite top board by fastening the wedge blocks with the dovetail groove type steel frame boundary ribs respectively; and sequentially connecting and fixing the remaining foam cement composite wall boards to the foam cement composite top board in the same way, thereby completing an overall assembly;

Step E: carrying out a waterproofing procedure according to a design requirement;

Step F: carrying out interior decoration according to a design requirement; and

Step G: installing bathroom equipment such as a pedestal pan, a washbasin and bathing facilities, and installing a bathroom door.

The above steps E, F and G may also be completed at a construction site.

The wedge block is slidable in the groove of the dovetail groove type boundary rib so that it can be installed quickly at a correct position.

The wedge block includes a hole matched with a bolt and a slot in which a nut may be placed .

According to another structure of the wedge block, the wedge block includes a threaded hole matched with a bolt.

Brief Description of Drawings

FIG. 1 is a schematic diagram illustrating a structure of a prefabricated integrated bathroom according to an example of the present disclosure;

FIG. 2-1 is a schematic diagram illustrating a structure of a foam cement composite bottom board according to an example 1 of the present disclosure;

FIG. 2-2 is a schematic diagram illustrating a structure of a foam cement composite wall board according to an example 1 of the present disclosure;

FIG. 2-3 is a schematic diagram illustrating a structure of a foam cement composite top board according to an example 1 of the present disclosure;

FIG. 2-4 is a schematic diagram illustrating a section of a dovetail groove type boundary rib in a foam cement composite board according to an example 1 of the present disclosure;

FIG. 3-1, FIG. 3-2 and FIG. 3-3 are schematic diagrams illustrating a structure of a wedge block according to an example 1 of the present disclosure;

FIG. 4 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite bottom board according to an example 1 of the present disclosure;

FIG. 5 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite wall board according to an example 1 of the present disclosure;

FIG. 6 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite top board according to an example 1 of the present disclosure;

FIG. 7-1 and FIG. 7-2 are schematic diagrams illustrating a structure of a wedge block according to an example 2 of the present disclosure;

FIG. 8 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite bottom board according to an example 2 of the present disclosure;

FIG. 9 is a schematic diagram illustrating a section of a flat groove type boundary rib according to an example 3 of the present disclosure;

FIG. 10-1 and FIG. 10-2 are schematic diagrams illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite bottom board according to an example 3 of the present disclosure;

FIG. 11 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite wall board according to an example 3 of the present disclosure;

FIG. 12-1 and FIG. 12-2 are schematic diagrams illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite top board according to an example 3 of the present disclosure;

FIG. 13 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite wall board according to an example 4 of the present disclosure;

FIG. 14 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite top board according to an example 4 of the present disclosure;

FIG. 15-1, FIG. 15-2 and FIG. 15-3 are schematic diagrams illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite bottom board according to an example 4 of the present disclosure;

FIG. 16 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite bottom board (a dovetail groove type boundary rib with a waterproof curved edge) according to an example 5 of the present disclosure;

FIG. 17 is a schematic diagram illustrating a structure of a connection node of a foam cement composite wall board and a foam cement composite bottom board (a flat groove type steel frame boundary rib with a waterproof curved edge) according to an example 5 of the present disclosure;

Descriptions of reference numerals in accompanying drawings

1 and 1': foam cement composite bottom boards;

2 and 2': foam cement composite wall boards;

3 and 3': foam cement composite top boards;

101: a steel frame;

102: a reinforcement truss;

103: an inorganic foam cement core material;

104: upper and lower cement mortar surface layers;

105: a steel wire mesh;

106: a connecting piece;

4: a bathroom door;

51: bathing facilities

52: a pedestal pan;

53: a washbasin;

6: a dovetail groove type boundary rib;

61: a groove;

62: a rectangular pipe;

7: a wedge block;

70: a hole;

71: a slot;

72: a threaded hole;

73: a nut;

74: a bolt;

75: a bolt sleeve;

76: a cover plate;

8: a right-angled connecting piece;

81: a via hole;

- 9: a flat groove type steel frame boundary rib;
- 91: a flat groove;
- 92: an opening;
- 93: a hollow chamber;
- 94: a through hole;
- 10: a dovetail groove type boundary rib with a waterproof curved edge;
- 11: a flat groove type steel frame boundary rib with a waterproof curved edge;

Detailed Description

Example 1

As shown in FIG. 1- FIG. 6, a prefabricated integrated bathroom provided in the present disclosure mainly includes: a foam cement composite bottom board 1, a foam cement composite wall board 2, a foam cement composite top board 3 and bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53.

A dovetail groove type steel frame boundary rib 6 is respectively arranged in each of the foam cement composite bottom board 1, the foam cement composite wall board 2 and the foam cement composite top board 3; the dovetail groove type steel frame boundary rib 6 includes upper and lower flanges and a dovetail groove type boundary rib groove 61; and also an embedded component, for example, a wedge block 7, is arranged in the groove 61 of the dovetail groove type boundary rib; the wedge block 7 includes a hole 70 matched with a bolt 74 and a slot 71 in which a nut 73 may be placed .

The connection between the foam cement composite bottom board 1 and the foam cement composite wall board 2 is carried out by running the bolts 74 through a right-angled connecting piece 8 and connecting the bolts 74 to the nuts 73 placed in the wedge blocks 7 of the foam cement composite bottom board 1 and the foam cement composite wall board 2 respectively.

The connection between the foam cement composite wall boards 2 and 2' is carried out by running the bolts 74 through the right-angled connecting piece 8 and connecting the bolts 74 to the nuts 73 placed in the wedge blocks 7 of the foam cement composite wall boards 2 and 2' respectively.

The connection between the foam cement composite wall board 2 and the foam cement composite top board 3 is carried out by running the bolts 74 through the right-angled connecting piece 8 and connecting the bolts 74 to the nuts 73 placed in the wedge blocks 7 of the foam cement composite wall board 2 and the foam cement composite top board 3.

A via hole 81 matched with a bolt is arranged on the right-angled connecting piece 8.

As shown in FIG. 2-1, FIG. 2-2, FIG. 2-3, FIG. 2-4 to FIG. 17, in an example of the present disclosure, the foam cement composite bottom board 1 and the foam cement composite bottom board 1' are both composited with a steel frame 101, a reinforcement truss 102, a steel wire mesh 105, an inorganic foam cement core material 103 and upper and lower cement mortar surface layers 104, where the steel wire mesh 105 is connected and fixed to the steel frame 101, and the steel wire mesh 105 may be entirely or partially paved according to a design requirement. Water drainage pipe fittings such as a drain pipe, a floor drain and the like may be arranged in the foam cement composite bottom board 1.

The foam cement composite wall board 2 and the foam cement composite wall board 2' are both composited with a steel frame 101, a reinforcement truss 102, an inorganic foam cement core material 103, upper and lower steel wire meshes 105, a plurality of connecting pieces 106 tied to the upper and lower steel wire meshes 105 and upper and lower cement mortar surface layers 104, where the steel wire meshes 105 are connected and fixed to the steel frame 101, and the steel wire meshes 105 may be entirely or partially paved according to a design requirement. A water supply pipe, a water supply connector, a drain hole for pedestal pan, a concealed switch box and a wire pipe may be arranged in the foam cement composite wall board 2, and also a door hole and a window hole may be arranged in the composite wall board.

The foam cement composite top board 3 and the foam cement composite top board 3' are both composited with a steel frame 101, a steel wire mesh 105, a reinforcement truss 102, an inorganic foam cement core material 103 and upper and lower cement mortar surface layers 104, where the steel wire mesh 105 is connected and fixed to the steel frame 101, and the steel wire mesh 105 may be entirely or partially paved according to a design requirement. A concealed lamp holder box and a pipeline may be arranged in the foam cement composite top board 3, and also a ventilation hole and an access hole may be arranged in the foam cement composite top board.

The wedge block 7 arranged in the groove 61 of the dovetail groove type boundary rib is slidable so

that it can be installed quickly at a correct position.

The wedge block 7 is matched in shape with the groove 61.

The wedge block 7 may be pre-placed in the groove 61 of the dovetail groove type boundary rib 6, or placed in the groove 61 of the dovetail groove type boundary rib 6 during installation.

According to an example 1 of the present disclosure, a construction method of a prefabricated integrated bathroom may include the steps of:

Step A: manufacturing a foam cement composite bottom board 1, a foam cement composite wall board 2 and a foam cement composite top board 3 according to a design requirement, where a dovetail groove type steel frame boundary rib 6 may be respectively arranged in each of the foam cement composite bottom board 1, the foam cement composite wall board 2 and the foam cement composite top board 3; the dovetail groove type steel frame boundary rib 6 includes upper and lower flanges and a dovetail groove type boundary rib groove 61; an embedded component, for example, a wedge block 7, may be arranged in the groove 61 of the dovetail groove type boundary rib; and the wedge block 7 includes a hole 70 matched with a bolt 74 and a slot 71 in which a nut 73 may be placed ;

Step B: connecting the foam cement composite bottom board 1 with the foam cement composite wall board 2;

first, placing the foam cement composite bottom board 1 on a horizontal base plane, then vertically placing the foam cement composite wall board 2 at a corresponding position of the foam cement composite bottom board 1 according to a design requirement; respectively placing the wedge block 7 in which the nut 73 is placed in the groove 61 of the dovetail groove type boundary rib arranged in each of the foam cement composite bottom board 1 and the foam cement composite wall board 2; running the bolts 74 through the right-angled connecting piece 8 respectively, and connecting and fixing the bolts 74 to the nuts 73 in the wedge blocks 7 so as to connect the foam cement composite bottom board 1 with the foam cement composite wall board 2 by fastening the wedge blocks 7 with the dovetail groove type steel frame boundary ribs 6 respectively;

Step C: connecting the foam cement composite wall board 2 with the foam cement composite wall board 2;

first, vertically placing a second foam cement composite wall board 2 at a corresponding position of the foam cement composite bottom board 1, adjusting the position of the second wall board relative to the first wall board, and connecting the second foam cement composite wall board 2 with the foam cement composite bottom board 1 in the way described in step B;

then, connecting the first foam cement composite wall board 2 with the second foam cement composite wall board 2: placing the wedge block 7 in which the nut 73 is placed in the groove 61 of the dovetail groove type boundary rib arranged in each of the foam cement composite wall boards 2, running the bolts 74 through the right-angled connecting piece 8 respectively, and connecting and fixing the bolts 74 to the nuts 73 in the wedge blocks 7 respectively so as to connect the foam cement composite wall board 2 and the foam cement composite wall board 2 by fastening the wedge blocks 7 with the dovetail groove type steel frame boundary ribs 6; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

Step D: connecting the foam cement composite wall board 2 with the foam cement composite top board 3;

placing the foam cement composite top board 3 on the foam cement composite wall board 2, respectively placing the wedge block 7 in which the nut 73 is placed in the groove 61 of the dovetail groove type boundary rib arranged in each of the foam cement composite top board 3 and the foam cement composite wall board 2, running the bolts 74 through the right-angled connecting piece 8 respectively and connecting and fixing the bolts to the nuts 73 in the wedge blocks 7 respectively so as to connect and fix the foam cement composite wall board 2 with the foam cement composite top board 3 by fastening the wedge blocks 7 with the dovetail groove type steel frame boundary ribs 6; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite top board in the same way, thereby completing an overall assembly;

Step E: carrying out a waterproofing procedure according to a design requirement;

Step F: carrying out interior decoration according to a design requirement; and

Step G: installing bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53, and installing a bathroom door 4.

The above steps E, F and G may also be completed at a construction site.

Example 2

As shown in FIG. 1, FIG. 2-1 to FIG. 2-4, FIG. 7-1, FIG. 7-2 and FIG. 8, a prefabricated integrated bathroom provided in the present disclosure mainly includes: a foam cement composite bottom board 1, a foam cement composite wall board 2, a foam cement composite top board 3 and bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53.

A dovetail groove type steel frame boundary rib 6 is respectively arranged in each of the foam cement composite bottom board 1, the foam cement composite wall board 2 and the foam cement composite top board 3; the dovetail groove type steel frame boundary rib 6 includes upper and lower flanges and a dovetail groove type boundary rib groove 61; and an embedded component, for example, a wedge block 7, may be arranged in the groove 61 of the dovetail groove type boundary rib; and also the wedge block 7 includes a threaded hole 72 matched with a bolt 74.

The connection between the foam cement composite bottom board 1 and the foam cement composite wall board 2 is carried out by running the bolts 74 through a right-angled connecting piece 8 and connecting the bolts 74 to the wedge blocks 7 arranged in the grooves 6 of the dovetail groove type boundary ribs 6 of the boards respectively.

The connection between the foam cement composite wall boards 2 and 2' is carried out by running the bolts 74 through the right-angled connecting piece 8 and connecting the bolts 74 to the wedge blocks 7 arranged in the grooves 6 of the dovetail groove type boundary ribs 6 of the boards respectively.

The connection between the foam cement composite wall board 2 and the foam cement composite top board 3 is carried out by running the bolts 74 through the right-angled connecting piece 8 and connecting the bolts 74 to the wedge blocks 7 arranged in the grooves 6 of the dovetail groove type boundary ribs of the boards respectively.

According to an example 2 of the present disclosure, a construction method of a prefabricated integrated bathroom may include the steps of:

Step A: manufacturing a foam cement composite bottom board 1, a foam cement composite wall board 2 and a foam cement composite top board 3 according to a design requirement, where a dovetail groove type steel frame boundary rib 6 is respectively arranged in each of the foam cement composite bottom board 1, the foam cement composite wall board 2 and the foam cement composite top board 3; the dovetail groove type steel frame boundary rib 6 includes upper and lower flanges and a dovetail groove type boundary rib groove 61; an embedded component, for example, a wedge block 7, may be arranged in the groove 61 of the dovetail groove type boundary rib; and the wedge block 7 includes a threaded hole 72 matched with a bolt 74;

Step B: connecting the foam cement composite bottom board 1 with the foam cement composite wall board 2;

first, placing the foam cement composite bottom board 1 on a horizontal base plane, then vertically placing the foam cement composite wall board 2 at a corresponding position of the foam cement composite bottom board 1 according to a design requirement; respectively placing a wedge block 7 in which a nut 73 is placed in the groove 61 of the dovetail groove type boundary rib arranged in each of the foam cement composite bottom board 1 and the foam cement composite wall board 2; running the bolts 74 through a right-angled connecting piece 8 respectively, connecting and fixing the bolts to the threaded holes 72 in the wedge blocks 7 respectively so as to connect and fix the foam cement composite bottom board 1 with the foam cement composite wall board 2 by fastening the wedge blocks 7 with the dovetail groove type steel frame boundary ribs 6 respectively; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite bottom board in the same way;

Step C: connecting the foam cement composite wall board 2 with the foam cement composite wall board 2';

first, vertically placing a second foam cement composite wall board 2 at a corresponding position of the foam cement composite bottom board 1, and connecting the second foam cement composite wall board 2 with the foam cement composite bottom board 1 in the way described in step B;

then, connecting the first foam cement composite wall board 2 with the second foam cement composite wall board 2: placing the wedge block 7 in which a nut 73 is placed in the groove 61 of the dovetail groove type boundary rib arranged in each of the foam cement composite wall boards 2, running bolts 74 through a right-angled connecting piece 8 respectively, and connecting and fixing the bolts to the threaded holes in the wedge blocks 7 so as to connect the two foam cement composite wall boards 2 by fastening the wedge blocks 7 with the dovetail groove type steel frame boundary ribs 61; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

Step D: connecting the foam cement composite wall board 2 with the foam cement composite top board 3;

placing the foam cement composite top board 3 on the foam cement composite wall board 2, respectively placing a wedge block 7 in which a nut 73 is placed in the groove 61 of the dovetail groove type boundary rib arranged in each of the foam cement composite top board 3 and the foam cement composite wall board 2; running the bolts 74 through the right-angled connecting piece 8 respectively, and connecting and fixing the bolts 74 to the threaded holes 72 in the wedge blocks 7 so as to connect and fix the foam cement composite wall board 2 with the foam cement composite top board 3 by fastening the wedge blocks 7 with the dovetail groove type steel frame boundary ribs 6 respectively; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite top board in the same way, thereby completing an overall assembly;

Step E: carrying out a waterproofing procedure according to a design requirement;

Step F: carrying out interior decoration according to a design requirement; and

Step G: installing bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53, and installing a bathroom door 4.

The above steps E, F and G may also be completed at a construction site.

Example 3

As shown in FIG. 1, FIG. 2-1 to FIG. 2-4, FIG. 9, FIG. 10-1, FIG. 10-2, FIG. 11, FIG. 12-1 and FIG. 12-2, a prefabricated integrated bathroom provided in the present disclosure mainly includes: a foam cement composite bottom board 1', a foam cement composite wall board 2 or a foam cement composite wall board 2', a foam cement composite top board 3' and bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53.

The foam cement composite bottom board 1' or the foam cement composite top board 3' is provided with a flat groove type steel frame boundary rib 9 which includes upper and lower flanges and a flat groove 91, a hole 70 is arranged on the flange, an opening 92 is arranged on a vertical side of the flat groove; and a hollow chamber 94 sealed by a steel plate or section steel is arranged in a flat groove with the opening 92 so as to insert a bolt 74 through the opening 92.

The foam cement composite wall board 2 is provided with a dovetail groove type steel frame boundary rib 6; the dovetail groove type steel frame boundary rib 6 includes upper and lower flanges and a dovetail groove type boundary rib groove 61; and an embedded component, for example, a wedge block 7, may be arranged in the groove 61 of the dovetail groove type boundary rib; the wedge block 7 includes a hole 70 matched with a bolt 74 and a slot 71 in which a nut 73 may be placed.

The foam cement composite wall board 2' is provided with a dovetail groove type steel frame boundary rib 6; the dovetail groove type steel frame boundary rib 6 includes upper and lower flanges and a dovetail groove type boundary rib groove 61; a hole 70 is arranged on each of the upper and lower flanges; and a rectangular pipe 62 is arranged in the dovetail groove type steel frame boundary rib 6.

The connection between the foam cement composite bottom board 1' and the foam cement composite wall board 2 is carried out by running a bolt 74 through the hole 70 and connecting the bolt 74 to the nut 73 placed in the wedge block 7.

The connection between the foam cement composite wall board 2' with the foam cement composite wall board 2 is carried out by running a bolt 74 through the hole 70 and connecting the bolt 74 to the nut 73 positioned in the wedge block 7.

The connection between the foam cement composite wall board 2 and the foam cement composite top board 3' is carried out by running a bolt 74 through the hole 70 and connecting the bolt 74 to the nut 73 positioned in the wedge block 7.

According to an example 3 of the present disclosure, a construction method of a prefabricated integrated bathroom may include the steps of:

Step A: manufacturing a foam cement composite bottom board 1', foam cement composite wall boards 2 and 2' and a foam cement composite top board 3' according to a design requirement;

Step B: connecting the foam cement composite bottom board 1' with the foam cement composite wall board 2;

first, placing the foam cement composite bottom board 1' on a horizontal base plane, vertically placing the foam cement composite wall board 2 at a corresponding position of the foam cement composite bottom board 1' according to a design requirement; placing a wedge block 7 in which a nut 73 is placed in a groove 61 of a dovetail groove type boundary rib arranged in the foam cement composite wall board 2; running a bolt 74 through a hole 70 from an opening 92 and connecting and fixing the bolt to the nut 73 arranged in the wedge block 7; and sequentially connecting and fixing the remaining foam cement composite wall boards to the foam cement composite bottom board in the same way;

Step C: connecting the foam cement composite wall boards 2 and 2';

first, vertically placing a second foam cement composite wall board 2' at a corresponding position of the foam cement composite bottom board 1', adjusting the position of the second wall board relative to a first wall board, and connecting the second foam cement composite wall board 2' with the foam cement composite bottom board 1' in the way described in step B;

then, connecting the first foam cement composite wall board 2 with the second foam cement composite wall board 2': placing a wedge block 7 in which a nut 73 is placed in a groove 61 of a dovetail groove type boundary rib arranged in the foam cement composite wall board 2, running a bolt 74 through a hole 70, and connecting and fixing the bolt to the nut 73 in the wedge block 7; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

Step D: connecting the foam cement composite wall board 2 with the foam cement composite top board 3';

placing the foam cement composite top board 3' on the foam cement composite wall board 2, placing a wedge block 7 in which a nut 73 is placed in a groove 61 of a dovetail groove type boundary rib arranged in the foam cement composite wall board 2, running a bolt 74 through a hole 70 from an opening 92 and connecting and fixing the bolt to the nut 73 in the wedge block 7; and sequentially connecting and fixing the remaining wall boards to the top board in the same way, thereby completing an overall assembly;

Step E: carrying out a waterproofing procedure according to a design requirement;

Step F: carrying out interior decoration according to a design requirement; and

Step G: installing bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53, and installing a bathroom door 4.

The above steps E, F and G may also be completed at a construction site.

Example 4

As shown in FIG. 1, FIG. 2-1 to FIG. 2-4, FIG. 7, FIG. 9, FIG. 12, FIG. 13 and FIG. 15-1 to FIG. 15-3, a prefabricated integrated bathroom provided in the present disclosure mainly includes: a foam cement composite bottom board 1', a foam cement composite wall board 2 or 2', a foam cement composite top board 3' and bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53.

A dovetail groove type steel frame boundary rib 6 is arranged in the foam cement composite wall board 2; the dovetail groove type steel frame boundary rib 6 includes upper and lower flanges and a dovetail groove type boundary rib groove 61; and an embedded component, for example, a wedge block 7, may be arranged in the groove 61 of the dovetail groove type boundary rib; the wedge block 7 includes a hole 70 matched with a bolt 74 and a slot 71 in which a nut 73 may be placed.

A flat groove type steel frame boundary rib 9 including upper and lower flanges and a flat groove 91 is arranged in each of the foam cement composite wall board 2' and the foam cement composite top board 3', a through hole 94 is arranged in the flat groove 91; a bolt sleeve 75 is arranged in the through hole 94; a cover plate 76 having the same shape as the bolt sleeve 75 is arranged on the upper flange of the flat groove 91; and a hole 70 is arranged on the cover plate 76.

The foam cement composite bottom board 1' is provided with the flat groove type steel frame boundary rib 9 which includes upper and lower flanges and a flat groove 91, a hole 70 is arranged on the flange; and a rectangular pipe 62 is arranged in the flat groove (as shown in FIG. 15-1 and FIG. 15-2).

The connection between the foam cement composite bottom board 1' and the foam cement composite wall board 2 is carried out by running a bolt 74 through the hole 70 and the bolt sleeve 75 and connecting the bolt to the nut 73 placed in the wedge block 7.

The connection between the foam cement composite wall board 2 and the foam cement composite wall board 2' is carried out by running a bolt 74 through the hole 70 and the rectangular pipe 62 and connecting the bolt to the nut 73 arranged in the wedge block 7.

The connection between the foam cement composite wall board 2 and the foam cement composite top board 3' is carried out by running a bolt 74 through the hole 70 and the bolt sleeve 75 and connecting the bolt to the nut 73 placed in the wedge block 7.

According to an example 4 of the present disclosure, a construction method of a prefabricated integrated bathroom may include the steps of:

Step A: manufacturing a foam cement composite bottom board 1', foam cement composite wall boards 2 and 2' and a foam cement composite top board 3' according to a design requirement;

Step B: connecting the foam cement composite bottom board 1' with the foam cement composite wall board 2;

first, placing the foam cement composite bottom board 1' on a horizontal base plane, vertically placing

the foam cement composite wall board 2 at a corresponding position of the foam cement composite bottom board 1' according to a design requirement; placing a wedge block 7 in which a nut 73 is placed in a groove 61 of a dovetail groove type boundary rib arranged in the foam cement composite wall board 2; running a bolt 74 through a hole 70 and a rectangular pipe 62 and connecting and fixing the bolt to the nut 73 arranged in the wedge block 7; and sequentially connecting and fixing the remaining foam cement composite wall boards to the foam cement composite bottom board in the same way;

Step C: connecting the foam cement composite wall boards 2 and 2';

first, vertically placing a second foam cement composite wall board 2' at a corresponding position of the foam cement composite bottom board 1', adjusting the position of the second wall board relative to a first wall board, and connecting the second foam cement composite wall board 2' with the foam cement composite bottom board 1' in the way described in step B;

then, connecting the first foam cement composite wall board 2 with the second foam cement composite wall board 2': placing a wedge block 7 in which a nut 73 is placed in a groove 61 of a dovetail groove type boundary rib arranged in the foam cement composite wall board 2, running a bolt 74 through a hole 70 and a bolt sleeve 75 and connecting and fixing the bolt to the nut 73 arranged in the wedge block 7; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

Step D: connecting the foam cement composite wall board 2 with the foam cement composite top board 3';

placing the foam cement composite top board 3' on the foam cement composite wall board 2, placing a wedge block 7 in which a nut 73 is placed in a groove 61 of a dovetail groove type boundary rib arranged in the foam cement composite wall board 2, running a bolt 74 through a hole 70 and a bolt sleeve 75 from an opening 92 and connecting and fixing the bolt to the nut 73 in the wedge block 7; and sequentially connecting and fixing the remaining wall boards to the top board in the same way, thereby completing an overall assembly;

Step E: carrying out a waterproofing procedure according to a design requirement;

Step F: carrying out interior decoration according to a design requirement; and

Step G: installing bathroom equipment such as bathing facilities 51, a pedestal pan 52 and a washbasin 53, and installing a bathroom door 4.

The above steps E, F and G may also be completed at a construction site.

Example 5

As shown in FIG. 16, in addition to structural features of the foam cement composite bottom boards described in the above examples 1-4, a foam cement composite bottom board 1 provided in an example 5 of the present disclosure includes a dovetail groove type boundary rib 10 with a waterproof curved edge for a waterproofing effect when the foam cement composite bottom board 1 is connected to a foam cement composite wall board 2. With the vertically upward curve of the bottom board, water may be prevented from seeping into a joint of the wall board and the bottom board in a bathroom. . The other features of the example are identical to those of the above examples and are therefore not redundantly described.

As shown in FIG. 17, in addition to structural features of the foam cement composite bottom boards described in the above examples 1-4, a foam cement composite bottom board 1' provided in the example 5 is provided with a flat groove type steel frame boundary rib 11 with a waterproof curved edge for a waterproofing effect when the foam cement composite bottom board 1' is connected to the foam cement composite wall board 2. The other features of the example are identical to those of the above examples and are therefore not redundantly described.

Those skilled in the art may combine different connecting ways of foam cement composite boards freely based on different design requirements in an example of the present disclosure. The foregoing examples are merely preferred examples of the present disclosure but not intended to limit the present disclosure, and any modifications, equivalent substitutions, improvements thereof made within the spirit and principles of the present disclosure shall be encompassed in the scope of protection of the present disclosure.

INDUSTRIAL APPLICABILITY

In the present disclosure, since foam cement composite boards are industrially produced and can resist fire for four hours or more and insulate sound of 42 decibels or higher and the composition materials are inorganic and inflammable materials and have the comprehensive performances such as energy saving, environmental protection, weight bearing, heat preservation, heat insulation, fire resistance, durability,

earthquake resistance, light weight and high strength, the prefabricated integrated bathroom disclosed in the present disclosure features weight bearing, heat preservation, heat insulation, durability, earthquake resistance, light weight (the deadweight of the integrated bathroom is only 3-4 tons) and excellent fireproofing and sound-insulating performances. It is simple and easy to mount and operate the prefabricated integrated bathroom firmly and quickly, and the wet operations that are implemented at a construction site of a conventional bathroom are greatly decreased, thereby lowering the environmental pollution and noise emission caused by constructing a conventional bathroom. So, an energy-saving, environment-friendly and green building product is provided in the present disclosure.

Claims

1. A prefabricated integrated bathroom, comprising: a foam cement composite bottom board, a foam cement composite wall board, a foam cement composite top board and bathroom equipment, wherein a dovetail groove type steel frame boundary rib is respectively arranged in each of the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board; the dovetail groove type steel frame boundary rib comprises upper and lower flanges and a dovetail groove type boundary rib groove; and an embedded wedge block is arranged in the groove;

the connection between the foam cement composite wall board and the foam cement composite bottom board is carried out by connecting bolts, a connecting piece, and the wedge blocks arranged in the grooves of the dovetail groove type boundary ribs of the boards;

the connection between the foam cement composite wall boards is carried out by connecting bolts, a connecting piece, and the wedge blocks arranged in the grooves of the dovetail groove type boundary ribs of the boards; and

the connection between the foam cement composite wall board and the foam cement composite top board is carried out by connecting bolts, a connecting piece, and the wedge blocks arranged in the grooves of the dovetail groove type boundary ribs of the boards.

2. A prefabricated integrated bathroom, mainly comprising: a foam cement composite bottom board, a foam cement composite wall board, a foam cement composite top board and bathroom equipment, wherein the foam cement composite bottom board or the foam cement composite top board is provided with a flat groove type steel frame boundary rib comprising upper and lower flanges and a flat groove, a hole is arranged on the flange, an opening is arranged on a vertical side of the flat groove; and a hollow chamber sealed by a steel plate or section steel is arranged in the flat groove with the opening so as to insert a bolt through the opening;

the foam cement composite wall board is provided with a dovetail groove type steel frame boundary rib; the dovetail groove type steel frame boundary rib comprises upper and lower flanges and a dovetail groove type boundary rib groove; and an embedded wedge block is arranged in the groove of the dovetail groove type boundary rib;

another foam cement composite wall board is provided with a dovetail groove type steel frame boundary rib; the dovetail groove type steel frame boundary rib comprises upper and lower flanges and a dovetail groove type boundary rib groove; a hole is arranged on each of the upper and lower flanges; and a rectangular pipe is arranged in the dovetail groove type steel frame boundary rib;

the connection between the foam cement composite bottom board and the foam cement composite wall board is carried out by running a bolt through the hole and connecting the bolt to a nut arranged in the wedge block;

the connection between the foam cement composite wall board and the another foam cement composite wall board is carried out by running a bolt through the hole and connecting the bolt to a nut arranged in the wedge block; and

the connection between the foam cement composite wall board and the foam cement composite top board is carried out by running a bolt through the hole and connecting the bolt to a nut arranged in the wedge block.

3. A prefabricated integrated bathroom, mainly comprising: a foam cement composite bottom board, a foam cement composite wall board, a foam cement composite top board and bathroom equipment, wherein a dovetail groove type steel frame boundary rib is arranged in the foam cement composite wall board; the dovetail groove type steel frame boundary rib comprises upper and lower flanges and a dovetail groove type boundary rib groove; and an embedded wedge block is arranged in the groove of the dovetail groove type boundary rib;

a flat groove type steel frame boundary rib comprising upper and lower flanges and a flat groove is arranged in each of the foam cement composite wall board and the foam cement composite top board, a through hole is arranged in the flat groove; a bolt sleeve is arranged in the through hole; a cover plate having the same shape as the bolt sleeve is arranged on the upper flange of the flat groove; and a hole is arranged on the cover plate;

the foam cement composite bottom board is provided with a flat groove type steel frame boundary rib comprising upper and lower flanges and a flat groove, a hole is arranged on the flange; and a rectangular pipe is arranged in the flat groove;

the connection between the foam cement composite bottom board and the foam cement composite wall board is carried out by running a bolt through the hole and the bolt sleeve and connecting the bolt to a nut arranged in the wedge block;

the connection between the foam cement composite wall board and the another foam cement composite wall board is carried out by running a bolt through the hole and the rectangular pipe and connecting the bolt to a nut arranged in the wedge block; and

the connection between the foam cement composite wall board and the foam cement composite top board is carried out by running a bolt through the hole and the bolt sleeve and connecting the bolt to a nut arranged in the wedge block.

4. The prefabricated integrated bathroom according to claims 1 to 3, wherein the foam cement composite bottom board is composited with a steel frame, a reinforcement truss, a steel wire mesh, an inorganic foam cement core material, and upper and lower cement mortar surface layers, and the steel wire mesh is connected and fixed to the steel frame; the steel wire mesh is entirely or partially paved according to a design requirement; and water drainage pipe fittings including a drain pipe and a floor drain and the like are arranged in the foam cement composite bottom board.

5. The prefabricated integrated bathroom according to claims 1 to 3, wherein the foam cement composite wall board is composited with a steel frame, upper and lower steel wire meshes, a plurality of connecting pieces tied to the upper and lower steel wire meshes, an inorganic foam cement core material, and upper and lower cement mortar surface layers, and the steel wire meshes are connected and fixed to the steel frame; the steel wire meshes are entirely or partially paved according to a design requirement; a water supply pipe, a water supply connector, a drain hole for pedestal pan, a concealed switch box and a wire pipe are arranged in the foam cement composite wall board; and a door hole and a window hole are arranged in the composite wall board.

6. The prefabricated integrated bathroom according to claims 1 to 3, wherein the foam cement composite wall board is composited with a steel frame, a steel wire mesh, a reinforcement truss, an inorganic foam cement core material, and upper and lower cement mortar surface layers, and the steel wire mesh is connected and fixed to the steel frame; the steel wire mesh is entirely or partially paved according to a design requirement; a water supply pipe, a water supply connector, a drain hole for pedestal pan, a concealed switch box and a wire pipe are arranged in the foam cement composite wall board; and a door hole and a window hole are arranged in the composite wall board.

7. The prefabricated integrated bathroom according to claims 1 to 3, wherein the foam cement composite top board is composited with a steel frame, a steel wire mesh, a reinforcement truss, an inorganic foam cement core material, and upper and lower cement mortar surface layers, and the steel wire mesh is connected and fixed to the steel frame; the steel wire mesh is entirely or partially paved according to a design requirement; a concealed lamp holder box and a pipeline are arranged in the foam cement composite top board; and a ventilation hole and an access hole are arranged in the foam cement composite top board.

8. The prefabricated integrated bathroom according to claims 1 to 3, wherein the wedge block arranged in the groove of the dovetail groove type boundary rib is slidable so that the wedge block is installed quickly at a correct position.

9. The prefabricated integrated bathroom according to claims 1 to 3, wherein the wedge block is pre-placed in the groove of the dovetail groove type boundary rib, or placed in the groove of the dovetail groove type boundary rib during installation.

10. The prefabricated integrated bathroom according to claims 1 to 3, wherein the wedge block is matched in shape with the groove.

11. The prefabricated integrated bathroom according to claims 1 to 3, wherein the wedge block includes a hole matched with a bolt and a slot in which a nut is placed.

12. The prefabricated integrated bathroom according to claims 1 to 3, wherein the wedge block includes a threaded hole matched with the bolt.

13. The prefabricated integrated bathroom according to claims 1, wherein the connecting piece is a right-angled connecting piece, and has a via hole matched with the bolt.

14. The prefabricated integrated bathroom according to claims 1 to 3, wherein an internal surface and an external surface of the prefabricated integrated bathroom are decorated with different ornaments and decoration materials so as to meet decoration requirements for different styles of bathrooms.

15. The prefabricated integrated bathroom according to claims 1 to 3, wherein the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board are pre-decorated with ornaments and decoration materials used for an internal surface and an external surface of the prefabricated integrated bathroom before the bathroom is assembled so that ornaments and decorations are completed after the bathroom is assembled.

16. The prefabricated integrated bathroom according to claims 1 to 3, wherein bathroom waterproofing is performed in the prefabricated integrated bathroom by using different coating-type or roll-type waterproof materials, and the waterproofing is performed for the foam cement composite bottom board before the bathroom is assembled or performed after the bathroom is assembled so as to meet different bathroom waterproofing requirements.

17. The prefabricated integrated bathroom according to claims 1 to 3, wherein the foam cement composite bottom board includes a dovetail groove type boundary rib with a waterproof curved edge for a waterproofing effect, when the foam cement composite bottom board is connected to the foam cement composite wall board and with the vertically upward curve of the bottom board, water is prevented from seeping into a joint of the wall board and the bottom board.

18. The prefabricated integrated bathroom according to claims 1 to 3, wherein the foam cement composite bottom board includes a flat groove type steel frame boundary rib with a waterproof curved edge for a waterproofing effect when the foam cement composite bottom board is connected to the foam cement composite wall board.

19. A construction method of a prefabricated integrated bathroom, comprising the steps of:
performing industrialized custom production for a foam cement composite bottom board, a foam cement composite wall board and a foam cement composite top board according to an actual requirement of a customer and
prefabricating water supply pipe fittings, water drainage pipe fittings, electric devices, and a door hole, a window hole and the like in the foam cement composite boards according to a design requirement;
assembling the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board accurately and quickly in such a way as building blocks and connecting and fixing the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board in a mechanical manner;
installing bathroom equipment to construct an integrated bathroom;
transporting the integrated bathroom to a construction site; and
installing the integrated bathroom in place using a hoisting crane.

20. The construction method of a prefabricated integrated bathroom according to claim 19, wherein waterproofing and internal and external decorations are completed for the integrated bathroom in a factory as required.

21. The construction method of a prefabricated integrated bathroom according to claim 19, wherein the bathroom equipment arranged in the integrated bathroom is also installed at a construction site.

22. A construction method of a prefabricated integrated bathroom, comprising the steps of:
step A: manufacturing a foam cement composite bottom board, a foam cement composite wall board and a foam cement composite top board according to a design requirement, wherein a dovetail groove type frame boundary rib is respectively arranged in each of the foam cement composite bottom board, the foam cement composite wall board and the foam cement composite top board; the dovetail groove type steel

frame boundary rib comprises upper and lower flanges and a dovetail groove type boundary rib groove; and an embedded wedge block is arranged in the groove;

step B: connecting the foam cement composite bottom board with the foam cement composite wall board;

first, placing the foam cement composite bottom board on a horizontal base plane, vertically placing the foam cement composite wall board at a corresponding position of the foam cement composite bottom board according to a design requirement; respectively placing a wedge block, in which a nut is placed, in each of the grooves of the dovetail groove type boundary ribs arranged in the foam cement composite bottom board and the foam cement composite wall board; running bolts through a connecting piece respectively and connecting and fixing the bolts to the nuts in the wedge blocks so as to connect and fix the foam cement composite bottom board with the foam cement composite wall board by fastening the wedge blocks with the dovetail groove type steel frame boundary ribs respectively; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite bottom board in the same way;

step C: connecting the foam cement composite wall boards;

first, vertically placing a second foam cement composite wall board at a corresponding position of the foam cement composite bottom board, adjusting the position of the second wall board relative to a first wall board, and connecting the second foam cement composite wall board with the foam cement composite bottom board in the way described in step B;

then, connecting the first wall board with the second wall board: placing a wedge block, in which a nut is placed, in the groove of each of the dovetail groove type boundary ribs arranged in the foam cement composite wall boards, running bolts through a connecting piece respectively, and connecting and fixing the bolts to the nuts in the wedge blocks so as to connect the foam cement composite wall boards by fastening the wedge blocks with the dovetail groove type steel frame boundary ribs respectively; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

step D: connecting the foam cement composite wall board with the foam cement composite top board;

first, placing the foam cement composite top board on the foam cement composite wall board, respectively placing a wedge block, in which a nut is placed, in each of the grooves of the dovetail groove type boundary ribs arranged in the foam cement composite top board and the foam cement composite wall board, running bolts through a connecting piece respectively, and connecting and fixing the bolts to the nuts in the wedge blocks so as to connect and fix the foam cement composite wall board with the foam cement composite top board by fastening the wedge blocks with the dovetail groove type steel frame boundary ribs respectively; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite top board in the same way, thereby completing an overall assembly;

step E: carrying out a waterproofing procedure according to a design requirement;

step F: carrying out interior decoration according to a design requirement; and

step G: installing bathroom equipment, and installing a bathroom door,

wherein the above steps E, F and G are also completed at a construction site, or the above steps E and F are performed on the bottom plate, the wall plate and the top plate before the bathroom is assembled.

23. The construction method of a prefabricated integrated bathroom according to claim 22, wherein the wedge block is slidable in the groove of the dovetail groove type boundary rib so that the wedge block is installed quickly at a correct position.

24. The construction method of a prefabricated integrated bathroom according to claim 22, wherein the wedge block includes a hole matched with a bolt, and a slot in which a nut is placed.

25. The construction method of a prefabricated integrated bathroom according to claim 22, wherein the wedge block includes a threaded hole matched with the bolt.

26. A construction method of a prefabricated integrated bathroom, comprising the steps of:

step A: manufacturing a foam cement composite bottom board, a foam cement composite wall board and a foam cement composite top board according to a design requirement;

step B: connecting the foam cement composite bottom board with the foam cement composite wall board:

first, placing the foam cement composite bottom board on a horizontal base plane, vertically placing the foam cement composite wall board at a corresponding position of the foam cement composite bottom

board according to a design requirement; placing a wedge block, in which a nut, is placed in a groove of a dovetail groove type boundary rib arranged in the foam cement composite wall board; running a bolt through a hole from an opening and connecting and fixing the bolt to the nut arranged in the wedge block; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite bottom board in the same way;

step C: connecting the foam cement composite wall board with a second foam cement composite wall board;

first, vertically placing the second foam cement composite wall board at a corresponding position of the foam cement composite bottom board, adjusting the position of the second wall board relative to a first wall board, and connecting the second foam cement composite wall board with the foam cement composite bottom board in the way described in step B;

then, connecting the first foam cement composite wall board with the second foam cement composite wall board: placing a wedge block, in which a nut, is placed in a groove of a dovetail groove type boundary rib arranged in each of the foam cement composite wall boards, running bolts through holes respectively, and connecting and fixing the bolts to the nuts in the wedge blocks; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

step D: connecting the foam cement composite wall board with the foam cement composite top board; placing the foam cement composite top board on the foam cement composite wall board, placing a wedge block, in which a nut is placed, in a groove of a dovetail groove type boundary rib arranged in the foam cement composite wall board, running a bolt through a hole from an opening and connecting and fixing the bolt to the nut in the wedge block; and sequentially connecting and fixing the remaining wall boards with the top board in the same way, thereby completing an overall assembly;

step E: carrying out a waterproofing procedure according to a design requirement;

step F: carrying out interior decoration according to a design requirement; and

step G: installing bathroom equipment, and installing a bathroom door;

wherein the above steps E, F and G are also completed at a construction site; or the above steps E and F are completed on the bottom plate, the wall plate and the top plate before the bathroom is assembled.

27. A construction method of a prefabricated integrated bathroom, comprising the steps of:

step A: manufacturing a foam cement composite bottom board, a foam cement composite wall board and a foam cement composite top board according to a design requirement;

step B: connecting the foam cement composite bottom board with the foam cement composite wall board;

first, placing the foam cement composite bottom board on a horizontal base plane, vertically placing the foam cement composite wall board at a corresponding position of the foam cement composite bottom board according to a design requirement; placing a wedge block, in which a nut is placed, in a groove of a dovetail groove type boundary rib arranged in the foam cement composite wall board; running a bolt through a hole and a rectangular pipe and connecting and fixing the bolt to the nut arranged in the wedge block; and sequentially connecting and fixing the remaining foam cement composite wall boards with the foam cement composite bottom board in the same way;

step C: connecting the foam cement composite wall board with a second foam cement composite wall board;

first, vertically placing the second foam cement composite wall board at a corresponding position of the foam cement composite bottom board, adjusting the position of the second wall board relative to a first wall board, and connecting the second foam cement composite wall board with the foam cement composite bottom board in the way described in step B;

then, connecting the first foam cement composite wall board with a second foam cement composite wall board: placing a wedge block, in which a nut is placed, in a groove of a dovetail groove type boundary rib arranged in each of the foam cement composite wall boards, running bolts through holes and bolt sleeves respectively and connecting and fixing the bolts to the nuts arranged in the wedge blocks; and sequentially connecting and fixing the remaining foam cement composite wall boards in the same way;

step D: connecting the foam cement composite wall board with the foam cement composite top board;

placing the foam cement composite top board on the foam cement composite wall board, placing a wedge block, in which a nut, is placed in a groove of a dovetail groove type boundary rib arranged in the foam cement composite wall board, running a bolt through a hole and a bolt sleeve from an opening and connecting and fixing the bolt to the nut in the wedge block; and sequentially connecting and fixing the remaining wall boards with the top board in the same way, thereby completing an overall assembly;

step E: carrying out a waterproofing procedure according to a design requirement;
step F: carrying out interior decoration according to a design requirement; and
step G: installing bathroom equipment, and installing a bathroom door,
wherein the above steps E, F and G are also completed at a construction site; or the above steps E and F are completed on the bottom plate, the wall plate and the top plate before the bathroom is assembled.

28. The construction method of a prefabricated integrated bathroom according to claim 19, 22, 26 or 27, wherein the foam cement composite bottom board includes a dovetail groove type boundary rib with a waterproof curved edge for a waterproofing effect when the foam cement composite bottom board is connected with the foam cement composite wall board; and with the vertically upward curve of the bottom board, water is prevented from seeping into a joint of the wall board and the bottom board in a bathroom.

29. The construction method of a prefabricated integrated bathroom according to claim 19, 22, 26 or 27, wherein the foam cement composite bottom board includes a flat groove type steel frame boundary rib with a waterproof curved edge for a waterproofing effect when the foam cement composite bottom board is connected to the foam cement composite wall board.