A multi-story building is constructed by first erecting at least one modular stairwell tower on a concrete base pad. The tower includes a number of horizontally alternating precast concrete modular stairwell units arranged in a stack and corresponding to twice the number of floors in the building. Each stairwell unit includes a precast reinforced concrete tower section having opposite side walls and opposite end walls defining an open top and an open bottom and a height generally equal to one half the vertical distance between two adjacent floors. An inclined stairway and a horizontal landing platform are formed within each tower section and are rigidly connected to the walls. Anchor members are embedded in the base pad and in upper and lower portions of the walls of each tower section, and adjacent anchor members are connected by weld plates. Each stairwell unit has a handrail supported by the corresponding stairway.
PRECAST CONCRETE MODULAR STAIRWELL TOWER

BACKGROUND OF THE INVENTION

[0001] In the construction of multi-story commercial and industrial buildings, it is common to erect a structural steel frame for the building after the concrete footers and foundation has been poured. The steel frame defines the vertical spaces for the stairwell and elevator shafts. Typically, prefabricated steel stairways with steps and a horizontal landing for each floor are installed as the structural steel frame for the building is erected, and each steel stairway and each landing are secured by bolts or welding to steel frame members for the building. After corrugated steel floor panels are installed over the horizontal beams of the steel frame, concrete is pumped onto the steel floor panels to form each concrete floor for the building. If the steel stairway has step pans and a landing pan, concrete is manually poured into the steel pans forming the steps of the stairway and also into the steel pan forming the landing for the stairway halfway between adjacent floors. After all of the floors and stairways and landings are formed, vertical metal stud walls are usually installed onto the steel frame members defining the stairwell space for the building and around the stairways and landings to define the stairwell shaft. The stairwell shaft is then lined with drywall or other fire resistant sheets, and handrails are installed for the steps for each floor so that the stairwell is essentially completed except for final finishing.

[0002] It has been proposed to form a staircase or a stairwell tower for a multi-story house or building by precasting modular staircase or stairwell components or units and then assembling or stacking the units to form a staircase or stairwell for the building. For example, U.S. Pat. No. 3,755,974, No. 3,830,026, No. 3,980,155, No. 4,248,020 and No. 5,377,778 disclose various preformed staircase or stairway modules, which may be formed of precast concrete, and with each module extending a full story of the multi-story house or building. After the modules are stacked, they form a stairway or stairwell system.

SUMMARY OF THE INVENTION

[0003] The present invention is directed to the construction of a modular stairwell tower which is preferably constructed prior to erecting the steel frame members for a multi-story building having a number of floors. The tower includes a series of precast concrete stairwell units arranged in a stack with the number of stairwell units corresponding to twice the number of floors in the building. Each of the stairwell units includes a precast concrete stairwell section having vertical opposite side walls and vertical opposite end walls defining an open bottom and an open top. The walls of each tower section have a vertical height generally equal to one half the vertical distance between two successive floors of the building, and each stairwell unit includes a preformed or precast inclined stairway connected to one of the side walls of the corresponding stairwell tower section. A preformed or precast horizontal platform is located adjacent an upper end of the inclined stairway in each tower section and is connected to the side walls and one of the end walls of a stairway landing.

[0004] Each of the stairwell units is horizontally oriented one hundred eighty degrees relative to each adjacent stairwell unit in the stack, and one of the walls of each alternate stairwell unit in the stack defines a doorway opening. Anchor members project into and are embedded in upper and lower portions of the walls of each of the stairwell units, and the anchor members in the lower portions of the bottom stairwell unit are rigidly connected, such as by welded plates, to anchor members embedded in a concrete support floor or base for the stairwell tower. Anchor members in the upper portions of the walls are rigidly connected, such as by welded plates, to the anchor members in the lower portions of the walls of the adjacent stairwell unit thereabove.

[0005] The modular stairwell tower of the invention provides for efficiently precasting the stairwell units away from the building site and for conveniently erecting or stacking the stairwell units with a crane. Structural steel frame members for the building may be subsequently attached to the erected stairwell tower, thereby providing stability and rigidity for the steel frame members as they are being erected. This attachment eliminates the need for a significant number of steel frame members used for bracing the steel frame as it is being erected. The modular stairwell tower of the invention also provides for convenient and safe access to all floors of the building as it is being constructed, thereby providing protection to the steel frame erection crew. The modular precast concrete stairwell tower further provides for fire rating without the need for dry wall or masonry and may be prime finished at the precasting facility or factory. In addition, fire line stand pipes may be installed within the stairwell tower to provide for fire protection during construction of the building. The construction of the stairwell tower prior to erecting the steel frame members for the building also enables workers to move tools and materials from floor to floor quickly and conveniently, thereby providing a savings in labor for constructing the building. The construction of the modular stairwell tower before erecting the frame members further eliminates the need for ladders and scaffolding and temporary railings during erection of the steel frame, further enhancing the safety aspect of the overall construction process.

[0006] Other features and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a perspective view of the multi-story commercial building having three modular stairwell towers constructed in accordance with the invention and showing in phantom the outline for the steel frame for the building;

[0008] FIG. 2 is a perspective view of two precast concrete stairwell modules or units and illustrating the stacking of a second unit onto a first floor unit;

[0009] FIG. 3 is a fragmentary vertical section through one of the stairwell towers, taken generally on the line 3-3 of FIG. 1;

[0010] FIG. 4 is a horizontal section of a stairwell tower, taken generally on the line 4-4 of FIG. 3;

[0011] FIG. 5 is a perspective view of a typical precast concrete stairwell module or unit used in each of the stairwell towers shown in FIG. 1, and being transported by an overhead crane with attached temporary bracing;

[0012] FIG. 6 is a fragmentary perspective view of a precast concrete stairwell unit and illustrating the forms and reinforcement used for forming a precast concrete stairway and horizontal landing;

[0013] FIG. 7 is a fragmentary vertical section through a precast concrete stairwell unit and illustrating the location of steel reinforcing bars within the concrete;
FIG. 8 is a perspective exploded view of anchor members embedded within corresponding walls of two adjacent stairwell units and with the connection member; FIG. 9 is a fragmentary vertical section through the embedded wall anchors shown in FIG. 8 after being connected by the connection member; FIG. 10 is a perspective exploded view of the anchor members and connector member for securing a wall of the bottom stairwell unit to the concrete floor support pad for the stairwell tower; FIG. 11 is a fragmentary section similar to FIG. 9 and showing the connection of the anchor members shown in FIG. 10; and FIG. 12 is a fragmentary vertical section through a wall of a stairwell unit and showing an embedded anchor member used for attaching a horizontal steel frame member or beam to the stairwell tower after it is constructed.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

FIG. 1 illustrates a multi-story rectangular building 20 which will receive an erected metal frame system including vertical steel columns connected by horizontal steel frame members or beams. The beams support corrugated steel floor panels onto which concrete is poured or pumped to form multiple concrete floors within the building. As illustrated in FIG. 1, the building 20 will have four floors, but it is to be understood that the building may have more or less floors.

In accordance with the present invention, one or more precast concrete modular stairwell towers 25 are constructed in accordance with the invention, and each tower 25 includes a vertical stack of precast reinforced concrete stairwell modules or units 30 and 30'. Each stairwell unit includes a rectangular precast reinforced concrete box-like tower section 35 and 35' formed by opposite side walls 38 and opposite end walls 42 defining an open top and an open bottom. The primary difference between the tower sections 35 and 35' is that alternate tower sections 35 and 35' have full doorway openings 44 (FIGS. 1, 4 and 5), and each tower section 35' has only a partial doorway opening 46. While the doorway openings 44 and 46 are illustrated in the end walls 42 of the tower sections 35 and 35', the doorway openings may be formed or cast in corresponding side walls 38.

The height of the side walls 38 and end walls 42 of the tower sections 35 and 35', is substantially equal to one half the vertical distance between two adjacent floors of the building 20. For example, the vertical height of the walls 38 and 42 may be approximately seven feet for a distance between floors of about fourteen feet. Each tower section 35 and 35' has an overall length within the range of 18 feet to 25 feet and preferably about 21.5 feet, and an overall width within the range of 9 feet to 12 feet and preferably about 10.5 feet.

Referring to FIGS. 3, 6 and 7, each of the stairwell units 30 and 30' includes a precast reinforced concrete inclined stairway 50 having steps 52 and a vertical height substantially equal to the vertical height of the walls 38 and 42 of the tower sections 35 and 35'. Each stairwell unit 30 and 30' also includes a precast reinforced concrete horizontal platform 55 at the upper end of each stairway 50 and forming a stairway landing, as best shown in FIGS. 3 and 4. The top surface of each platform or landing 55 is preferably flush with the top surfaces of the walls 38 and 42 of the corresponding tower section 35 and 35'. As also shown in FIGS. 3 and 7, the bottom surface of each stairway 50 is flush with the bottom surfaces of the corresponding walls 38 and 42.

The stairway 50 and platform 55 in each stairwell unit 30 and 30' has conventional steel reinforcing mats or bars, commonly referred to as rebars. As shown in FIGS. 6 and 7, the horizontal rebars 58 in each stairway 50 are positioned under the steps 52 and have end portions projecting into corresponding holes 62 (FIG. 6) formed or drilled within the adjacent side wall 38 of the stairwell unit. The end portions of the rebars 58 are secured by an adhesive such as epoxy within the holes 62 after the inclined step form member 65 and bottom form sheets 67 and support rail 68 are installed within the tower section. As also shown in FIG. 6, the step riser form members 72 each have one end portion secured to the inclined stairway form member 65 by an angle bracket 74 and bolts and an opposite end portion temporarily secured to the adjacent wall 38 by an angled bracket 77 and anchor screws.

FIG. 6 also shows the vertical form panel or member 82 and horizontal form panel 84 which are temporarily installed within each tower section to form the precast reinforced concrete landing platform 55. Each platform 55 also has conventional concrete reinforcement mats or rods which include parallel spaced rebars 58 having end portions projecting into corresponding holes within the side walls 38 and end wall 42 where the end portions are secured by adhesive or epoxy. While only a portion of the reinforcing rods 58 are shown in FIG. 6, it is to be understood that other steel reinforcement mats and/or rods are used in the precast concrete stairway 50 and platform 55 so that the stairway is rigidly secured to the adjacent side wall 38, and the platform 55 is rigidly secured to the opposite side walls 38 and adjacent end wall 42.

As shown in FIG. 3, each stairwell tower 25 is supported by a poured reinforced concrete floor or base pad 95 which may have a thickness of several feet. Concrete is poured within a cavity formed within the ground and containing steel reinforcement mats and/or bars. The base pad 95 may be cast within a cavity in the ground before the bottom concrete floor is cast for the building 20.

Referring to FIGS. 2 and 8, the upper and lower portions of each of the walls 38 and 42 of each tower section 35 and 35' have embedded anchor members 105 which are spaced at predetermined locations around the periphery of the tower section. Each of the anchor members 105 includes a steel angle member 107 and a plurality of three reinforcing bars or rebars 109 welded to the horizontal flange of the angle member 107. The concrete base or floor pad 95 also has anchor members 110 (FIG. 10) located under the walls 38 and 42 of the bottom stairwell unit 30. Each anchor 110 includes a horizontal flat steel plate 112 and a set of four vertical reinforcing bars or rebars 114 having upper ends welded to the plate 112 and projecting downwardly into the base pad 95.

After the first or bottom precast concrete stairwell unit 30 is positioned on the base pad 95 (FIG. 2) with the use of an overhead crane having support cables 118, the anchor members 105 in the lower wall portions of the walls 38 and 42 of the stairwell unit 30 are aligned with the anchor members 110 embedded within the base pad 95, as shown in FIGS. 2 and 11. A set of shims and grout (not shown) are inserted within a gap or space 121 between the bottom surfaces of the walls 38 and 42 to ensure that the vertical walls of the bottom stairwell unit 30 are precisely plum. Each set of anchor members 105 and 110 is then rigidly connected by a connector.
member 122 in the form of a steel angle which is welded to the vertical flange of the anchor member 105 and the horizontal plate of the anchor member 110, as shown in FIG. 11.

[0028] Referring to FIGS. 3-5, each of the stairwell modules or units 30 and 30' includes an inclined metal fabricated handrail 130 which is rigidly secured to the corresponding stairway 50. After the second stairwell unit 30 is rotated one hundred eighty degrees relative to the bottom stairwell unit 30 and is positioned in stacked relation on the first or bottom stairwell unit 30 (FIG. 2) with the aid of the overhead crane cables 118, the anchor members 105 (FIGS. 8 & 9) within the lower portions of the walls 38 and 42 of the second stairwell unit 30' overlap the anchor members 105 embedded within the upper portions of the walls 38 and 42 of the bottom stairwell unit 30, as shown in FIGS. 8 and 9. Shimms and then grout are inserted into the space 134 between the bottom surfaces of the walls 38 and 42 of the second stairwell unit 30' and the corresponding walls 38 and 42 of the bottom stairwell unit 30. The adjacent anchor members 105 are then rigidly connected by a rigid connector member 138 in the form of a steel plate which is welded to the aligned vertical flanges of the anchor members 105, as shown in FIG. 9.

[0029] After the second stairwell unit 30' is rigidly connected to the first stairwell unit 30, as shown in FIG. 3, a U-shaped handrail section 140 is welded to the adjacent ends of the handrails 130 so that the handrails are continuous. An inclined handrail 145 (FIG. 4) may also be preattached to the adjacent side wall 38 of each stairwell unit 30 and 30', and these handrails 145 are connected by a horizontal handrail 148 attached to the end wall 42 above the landing platform 55. The above steps are repeated until all of the stairwell units 30 and 30' are assembled or erected to form the stairwell tower 25.

[0030] Since each of the precast concrete stairwell units 30 and 30' has substantially the same construction except for the doorway openings 44 and 46, and the height of each stairwell unit is essentially one half the vertical distance between two adjacent floors, each of the stairwell units 30' is rotated or horizontally oriented by 180 degrees with respect to the adjacent stairwell unit 30 therebelow. This requires that the embedded anchor members 105 within the upper and lower portions of the walls 38 and 42 of each stairwell unit be uniformly and precisely located so that all of the anchor members are vertically aligned and can be welded together to form a rigid and high strength stairwell tower 25. As shown in FIG. 1, one of the stairwell towers 25 may be provided at the top with an additional stairwell unit 30 in order to provide convenient access to the roof of the building 20 after it is constructed.

[0031] As mentioned above, it is desirable to construct or erect each of the modular stairwell towers 25 before the steel framing or frame members are erected for the building 20. In this manner, each of the towers 25 may serve as a rigid anchor for the steel frame members, thereby eliminating the need for a significant number of diagonal steel bracing members and shear members. Thus referring to FIG. 12, the precast concrete walls 38 and 42 of selected stairwell units 30 and 30' may be provided with embedded steel anchor members 152 each of which includes a vertical flat steel plate 154. A set of horizontal anchor rods or bars 156 having head portions are welded to the plate 154 and project into the wall 38 or 42 at each location where it is desired to connect a horizontal steel beam or frame member 160. An angular connector member or plate 162 is then welded to the plate 154 and the frame member 160 to form a rigid connection of the frame member to the wall.

[0032] Referring to FIG. 5, a stairwell module or unit 30 is shown with a doorway opening 44 within an end wall 42. While the unit 30 is being lifted by the cables 118 extending from an overhead crane and being transported from the precast facility to the construction site for the building 20, a set of cross braces 168 are temporarily secured to the walls 42 and 38 across the doorway 44 to prevent any racking or movement of the walls with respect to each other.

[0033] From the drawings and the above description, it is apparent that a modular stairwell tower 25 and its method of construction in accordance with the invention provides desirable features and advantages. For example, by first constructing one or more of the stairwell towers at a building construction site, each tower provides the construction workers with convenient and safe access to all floors of the building during construction, and thereby provides protection for the erection crew for the steel frame as well as for the construction for the concrete floors. The tower also eliminates the need for temporary ladders and scaffolding and temporary railings while erecting the steel frame. Each of the stairwell units 30 and 30' may also be economically produced at a remote precast facility where bad weather does not stop production. Furthermore, if the stairwell tower or towers are first erected and completed prior to erecting the steel frame for the building, the steel frame members may be anchored to the tower or towers, thereby eliminating the need for many diagonal bracing frame members and shear wall bracing frame members within the building. The steel workers may also use each stairwell tower for conveniently moving their tools and materials from floor to floor during erection of the steel frame for the building. The mounting of each stairway railing within each stairwell unit before stacking the units also substantially simplifies the installation of a railing system. After each stairwell tower is completed, fire hose stand pipes may be installed within the tower and connected to a water supply to facilitate fire protection during construction of the building.

[0034] While the method and form of modular tower herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to the precise method and tower described, and that changes may be made therein without departing from the scope and spirit of the invention as defined in the appended claims. For example, it is within the scope of the invention to provide each stairwell with a fabricated metal stairway and landing platform which are secured to the tower walls of each stairwell unit in the event that a precast concrete stairway and landing platform are not desired or required. Also, each of the stairwell units may have an oval configuration with rounded end walls instead of a rectangular configuration as shown in the drawings.

We claim:

1. A modular stairwell tower for use in the construction of a multi-story building having a number of floors, said tower comprising

a series of precast concrete stairwell units arranged in a stack with the number of stairwell units corresponding to twice said number of floors in said building,
each of said stairwell units including a precast reinforced concrete tower section having vertical opposite side walls and vertical opposite end walls defining an open bottom and an open top,
said walls of each of said tower sections having a vertical height generally equal to one half a vertical distance between two successive floors of said building, an inclined stairway in each of said tower sections and connected to one of said side walls with each stairway having a series of steps, a horizontal platform located adjacent an upper end of said stairway in each said tower section and connected to said side walls and one of said end walls of said tower section to form a horizontal landing, each of said stairwell units being horizontally oriented one hundred eighty degrees relative to each adjacent said stairwell unit, at least one of said walls of each of alternate said tower sections in said stack defining a doorway opening, anchor members projecting into and embedded in upper and lower portions of said walls of each of said tower sections, and anchor members in said upper portions of said walls of said tower sections rigidly connected to said anchor members in said lower portions of said walls of the adjacent said tower section thereafter.

2. A stairwell tower as defined in claim 1 wherein at least one of said walls of at least one of said tower sections defines a partial doorway opening vertically aligned with said doorway opening in the adjacent said tower section therebelow.

3. A stairwell tower as defined in claim 1 and including a poured reinforced concrete floor pad supporting said stairwell tower, a set of metal anchor members embedded in said floor pad adjacent said walls of a bottom said stairwell unit, and metal connector members welded to said anchor members in said floor pad and to corresponding adjacent said anchor members in said lower portions of said walls of said bottom stairwell unit.

4. A stairwell tower as defined in claim 1 wherein said stairway in each of said stairwell units supports an inclined handrail, and U-shaped handrail sections above said platforms in said stairwell units and rigidly connecting said inclined handrail in each said stairwell unit to said inclined handrail of the adjacent said stairwell unit thereafter.

5. A stairwell tower as defined in claim 1 and including spaced horizontal reinforcing bars having end portions projecting into and secured to said one side wall of each said tower section, and said reinforcing bars extend into the corresponding precast concrete said inclined stairway in said tower section.

6. A stairwell tower as defined in claim 1 and including spaced horizontal reinforcing bars having end portions projecting into and secured to said one end wall of each said tower section and extending into the corresponding precast concrete said platform.

7. A stairwell tower as defined in claim 1 wherein said building is adapted to receive an erected steel frame, and said walls of said precast stairwell units of said stairwell tower have embedded anchor members for rigidly connecting subsequently erected steel frame members for said building.

8. A stairwell tower as defined in claim 1 wherein each of said tower sections has an overall length within the range of one half a vertical distance between two successive floors of said building.

9. A first transportable precast concrete stairwell unit for use in erecting a modular stairwell tower in a building having multiple floors, said first stairwell unit comprising a precast reinforced concrete tower section having vertical opposite side walls and vertical opposite end walls defining an open bottom and an open top, said walls of said tower section having a vertical height generally equal to one half a vertical distance between two successive floors of the building, a preformed inclined stairway connected to one of said side walls and including a series of steps, a horizontal platform located adjacent an upper end of said stairway and connected to said side walls and one of said end walls to form a horizontal landing, and anchor members projecting into and embedded in upper and lower portions of said walls of said tower section.

10. A stairwell unit as defined in claim 9 in combination with a second said stairwell unit including said tower section, said stairway, said platform and said anchor members, said walls of said second stairwell unit stacked on and supported by corresponding said walls of said first stairwell unit, said second stairwell unit being rotated one hundred eighty degrees relative to said first stairwell unit, and said anchor members in said lower portions of said walls of said second stairwell unit rigidly connected to said anchor members in said upper portions of said walls of said first stairwell unit.

11. A stairwell unit as defined in claim 10 wherein at least one of said walls of said tower section of said first stairwell unit defines a doorway opening.

12. A stairwell unit as defined in claim 11 wherein at least one of said walls of said tower section of said second stairwell unit defines a partial doorway opening vertically aligned with said doorway opening in said first stairwell unit.

13. A stairwell unit as defined in claim 11 and including a poured reinforced concrete floor pad supporting said first stairwell unit, a set of metal anchor members embedded in said floor pad adjacent said walls of said first stairwell unit, and metal connector members welded to said anchor members in said floor pad and to corresponding adjacent said anchor members in said lower portions of said walls of said first stairwell unit.

14. A stairwell unit as defined in claim 13 wherein said stairway in each of said first and second stairwell units supports an inclined handrail, and a U-shaped handrail section above said platform of said first stairwell unit and rigidly connecting said inclined handrail of said first stairwell unit to said inclined handrail of said second stairwell unit.

15. A stairwell unit as defined in claim 9 and including spaced horizontal reinforcing bars having end portions projecting into and secured to said one side wall, and said reinforcing bars extend into a precast concrete said inclined stairway of said stairwell unit.

16. A stairwell unit as defined in claim 9 and including spaced horizontal reinforcing bars having end portions projecting into and secured to said one end wall of said stairwell unit and extending into a precast concrete said platform.

17. A series of said precast stairwell units as defined in claim 9 for use in a multi-story building having a number of floors, said stairwell units arranged in a stack with the number of stairwell units corresponding to twice said number of floors in said building and forming a stairwell tower, each of said stairwell units in said stairwell tower including said tower section, said stairway, said platform and said anchor members,
said walls of each said stairwell unit above a bottom said stairwell unit supported by said walls of the adjacent said stairwell unit therebelow, and
said anchor members in said walls of said stairwell units being rigidly secured to said anchor members in said walls of adjacent said stairwell units.

18. A stairwell unit as defined in claim 17 wherein said building is adapted to receive an erected steel frame, and said walls of said precast stairwell units of said stairwell tower have embedded anchor members for rigidly connecting subsequently erected steel frame members for said building.

19. A modular tower for use in the construction of a multi-story building having a number of floors, said tower comprising a series of precast concrete tower units arranged in a stack with the number of tower units corresponding to twice said number of floors in said building, each of said tower units including vertical opposite side walls and vertical opposite end walls defining an open bottom and an open top, said walls of each of said tower sections having a vertical height generally equal to one half a vertical distance between two successive floors of said building, at least one of said walls of each of alternate said tower units in said stack defining a doorway opening, anchor members projecting into and embedded in upper and lower portions of said walls of each of said tower units, and said anchor members in said upper portions of said walls of said tower units rigidly connected to said anchor members in said lower portions of said walls of the adjacent said tower unit thereabove.

20. A modular tower as defined in claim 19 and including a poured reinforced concrete floor pad supporting said tower, a set of metal anchor members embedded in said floor pad adjacent said walls of a bottom said tower unit, and metal connector members welded to said anchor members in said floor pad and to corresponding adjacent said anchor members in said lower portions of said walls of said bottom tower unit.

21. A modular tower as defined in claim 19 wherein said building is adapted to receive an erected steel frame, and said walls of said precast tower units have embedded anchor members for rigidly connecting subsequently erected steel frame members for said building.

22. A method of constructing a modular stairwell tower for a multi-story building having a steel frame and a plurality of floors, said method comprising the steps of forming a support base for the stairwell tower, precasting a series of reinforced concrete stairwell tower sections each having opposite side walls and opposite end walls and with the height of the side and end walls generally equal to one half the vertical distance between two adjacent floors, forming a doorway opening within at least one wall of alternate said tower sections, forming within each stairwell tower section an incline stairway having steps and extending to a horizontal platform forming a landing at an upper end of the stairway, rigidly connecting each stairway and landing to the walls of the corresponding tower section to form a series of modular stairwell units, positioning a first stairwell unit on the support base and anchoring the first stairwell unit to the support base, successively stacking a series of the stairwell units on top of the first stairwell unit with alternate stairwell units being horizontally oriented one hundred eighty degrees relative to each adjacent stairwell unit, and anchoring the walls of each stairwell unit to the walls of adjacent stairwell units to form a precast concrete stairwell tower.

23. A method as defined in claim 22 and including the step of forming the inclined stairway and landing of each stairwell unit with precast concrete, and providing each stairway and horizontal platform with horizontal reinforcing rods projecting into and secured to adjacent walls of the corresponding precast concrete stairwell unit.

24. A method as defined in claim 22 and including the step of erecting a steel frame for the building around the stairwell tower, and rigidly connecting steel frame members to the stairwell tower.

25. A method as defined in claim 22 wherein each of the tower sections is formed with an overall length within the range of eighteen feet to twenty five feet and an overall width within the range of nine feet to twelve feet.

26. A method as defined in claim 22 and including the steps of mounting an inclined handrail on the stairway of each stairwell unit prior to stacking the stairwell units.

27. A method of constructing a modular concrete tower for a multi-story building having a steel frame and a plurality of floors, said method comprising the steps of forming a support base for the modular tower, precasting a series of reinforced concrete tower units each having opposite side walls and opposite end walls and with the height of the side and end walls generally equal to one half the vertical distance between two adjacent floors, forming a doorway opening within at least one wall of alternate said tower units, positioning a first tower unit on the support base and anchoring the first tower unit to the support base, successively stacking a series of the tower units on top of the first tower unit, and anchoring the walls of each tower unit to the walls of each adjacent tower units to form a precast concrete modular tower.

28. A method as defined in claim 27 and including the step of erecting a steel frame for the building around the tower, and rigidly connecting steel frame members to the tower units.

29. A method as defined in claim 27 wherein each of the tower units is formed with an overall length within the range of eighteen feet to twenty five feet and an overall width within the range of nine feet to twelve feet.