CLAIMS

1. A building comprising:

a plurality of prefabricated building units, each having a horizontal upper surface, and a plurality of vertical wall surfaces, wherein some of the prefabricated building units include a plurality of vertically disposed formwork structures;

a structural deck composed of structural bearing material disposed on said horizontal upper exterior surface and using said horizontal upper exterior surface as permanent formwork; and

a plurality of vertically disposed structural elements each formed within one of said vertically disposed formwork structures.

2. The building of claim 1 wherein a second set of one or more prefabricated building units are stacked on top of a first set of one or more prefabricated modular building units to form a second level of the building, such that said structural deck is disposed between the first and second sets of prefabricated building units, and the weight of the structural deck and structures above are substantially supported by the vertically disposed structural elements.

3. The building of claim 2 wherein the vertically disposed formwork structures are hollow column formwork structures, and the vertically disposed structural elements are columns.

4. The building of claim 2 wherein the vertically disposed formwork structures are wall formwork structures, and the vertically disposed structural elements are walls.

5. The building of claim 3 wherein the hollow column formwork structures in the first and second prefabricated building units are aligned to form a single hollow column formwork structure and a structural column is formed within the hollow column formwork structures of the first and second prefabricated building units.

6. The building of claim 2 further comprising additional prefabricated building units stacked on said first and second sets of prefabricated building units to form additional levels of said building.

7. The building of claim 1 wherein said prefabricated building units include at least one of: installed floor finish, interior walls, doors, interior glazing, fixtures, cabinetry, plumbing fixtures, fixed appliances, electrical wiring, lighting, water and waste piping, and HVAC equipment.

8. The building of claim 1 wherein a plurality of prefabricated building units have doorways opening into adjacent prefabricated building units, such that a single occupied habitable space unit is created from multiple prefabricated building units.

9. The building of claim 1 wherein the prefabricated building units include a service shaft with plumbing and electrical components passing therethrough, and connecting to plumbing and electrical components external to said prefabricated units.

10. The building of claim 2 further comprising at least one tower core containing elevators and stairs adjacent to some of said prefabricated building units.

11. The building of claim 1 wherein said base further comprises a base upon which the first story of said prefabricated building units rests.

12. The building of claim 11 wherein said base comprises a podium level building that is not constructed of prefabricated building units.

13. A building comprising:

a plurality of prefabricated modules disposed on multiple levels of said building;

a concrete deck disposed between the prefabricated modules on adjacent levels of said building, wherein the concrete deck uses the top of the prefabricated modules as permanent formwork; and

vertically disposed structural elements disposed in openings passing through the prefabricated modules, wherein the vertically disposed structural elements use the openings as permanent formwork.

14. A method of constructing a building comprising:

constructing a plurality of prefabricated building units, each having a horizontal upper exterior surface and a plurality of vertical wall surfaces, wherein at least some of the prefabricated building units have a plurality of vertically disposed formwork structures;

lowering a plurality of the prefabricated building units onto a pre-existing base at a construction site to create a first story of the building;

applying structural bearing material to fill the vertically disposed formwork structures to create vertically disposed structural elements; and

applying structural bearing material to the horizontal upper exterior surfaces of the prefabricated building units to create a single structural deck over the prefabricated building units.

15. The method of claim 14 further comprising creating a second story of the building by stacking additional prefabricated building units on top of the structural deck, such that vertically disposed formwork structures in the second story prefabricated building units line up with the vertically disposed formwork structures in the first story.

16. The method of claim 15 wherein the prefabricated building units include a service shaft with plumbing and electrical components passing through the service shaft, and wherein said method includes installing and connecting plumbing and electrical components in the service shaft.

17. The method of claim 14 wherein the vertically disposed formwork structures are hollow column formwork structures, and the vertically disposed structural elements are columns.

18. The method of claim 14 wherein the vertically disposed formwork structures are wall formwork structures, and the vertically disposed structural elements are walls.

19. The method of claim 17 further comprising:

constructing column cages in the locations where column formwork structures will be located; and

wherein the step of lowering comprises lowering the prefabricated units such that the column cages fit inside the column form work structures.

20. The method of claim 19 further comprising adding second story column cages to the existing column cages on the first story prior to the step of stacking additional prefabricated building units on top of the prefabricated building units on the base.

21. A method of constructing a building comprising:

arranging a plurality of prefabricated modules disposed on a first level of said building, at least some of the prefabricated modules having vertically disposed formwork structures;

pouring a concrete deck on top of the prefabricated modules on the first level using the top of the prefabricated modules on the first level as permanent formwork, the concrete also filling the vertically disposed formwork structures; and

arranging a second level of prefabricated modules on top of the concrete deck.

22. The method of claim 21 further comprising:

creating additional levels of said building by repeating the steps of arranging and pouring for said additional building levels.

CLAIMS

1. A building comprising:

a plurality of non-bearing prefabricated building units, each having a horizontal upper surface including a horizontal upper exterior surface, and a plurality of vertical non-bearing wall surfaces, wherein some of the plurality of non-bearing prefabricated building units include a plurality of vertically disposed hollow column formwork structures;

a structural deck composed of structural bearing material poured in a liquid state on said horizontal upper exterior surface and using said horizontal upper exterior surface as permanent non-structural formwork; and

a plurality of vertically disposed column structural elements each formed by pouring structural material in a liquid state within one of said plurality of vertically disposed hollow column formwork structures, and wherein there are no poured walls such that structural loads in the building are supported substantially by the structural deck and the plurality of vertically disposed column structural elements.

2. The building of claim 1 wherein a second set of one or more of said plurality of non-bearing prefabricated building units are stacked on top of a first set of one or more of said plurality of non-bearing prefabricated building units to form a second level of the building, such that said structural deck is disposed between the first and second sets of prefabricated building units, and the weight of the structural deck and structures above are supported by the plurality of vertically disposed column structural elements and not by the plurality of non-bearing prefabricated building units.

3. The building of claim 1 wherein the plurality of vertically disposed hollow column formwork structures in the first and second sets of non-bearing prefabricated building units are aligned to form a single hollow column formwork structure and a structural column is formed within the plurality of vertically disposed hollow column formwork structures of the first and second sets of non-bearing prefabricated building units.

4. The building of claim 2 further comprising additional ones of the plurality of non-bearing prefabricated building units stacked on said first and second sets of non-bearing prefabricated building units to form additional levels of said building.

5. The building of claim 1 wherein said plurality of non-bearing prefabricated building units include at least one of: installed floor finish, interior walls, doors, interior glazing, fixtures, cabinetry, plumbing fixtures, fixed appliances, electrical wiring, lighting, water and waste piping, and HVAC equipment.

6. The building of claim 1 wherein some of the plurality of non-bearing prefabricated building units have doorways opening into adjacent non-bearing prefabricated building units, such that a single occupied habitable space unit is created from multiple ones of the plurality of non-bearing prefabricated building units.

7. The building of claim 1 wherein the plurality of non-bearing prefabricated building units include a service shaft with plumbing and electrical components passing therethrough, and connecting to plumbing and electrical components external to said plurality of non-bearing prefabricated building units.

8. The building of claim 2 further comprising at least one tower core containing elevators and stairs adjacent to some of said plurality of non-bearing prefabricated building units.

9. The building of claim 1 comprising a base upon which a first story of said plurality of non-bearing prefabricated building units rests.

10. The building of claim 9 wherein said base comprises a podium level building that is not constructed of said plurality of non-bearing prefabricated building units.

11. A building comprising:

a plurality of non-bearing prefabricated modules disposed on multiple levels of

said building;

a concrete deck disposed between the plurality of non-bearing prefabricated modules on adjacent levels of said building, wherein the concrete deck is poured in a liquid state on top of the plurality of non-bearing prefabricated modules using a top of the plurality of non-bearing prefabricated modules as permanent non-structural formwork; and

vertically disposed column structural elements disposed in openings passing through the plurality of non-bearing prefabricated modules, wherein the vertically disposed column structural elements are poured in a liquid state using the openings as permanent formwork, and wherein there are no poured walls such that structural loads in the building are supported substantially by the concrete deck and the vertically disposed column structural elements.

12. A method of constructing a building comprising:

constructing a plurality of non-bearing prefabricated building units, each having a horizontal upper exterior surface and a plurality of vertical non-bearing wall surfaces, wherein at least some of the plurality of non-bearing prefabricated building units have a plurality of vertically disposed hollow column formwork structures;

lowering a plurality of the non-bearing prefabricated building units onto a pre-existing base at a construction site to create a first story of the building;

applying structural bearing material in a liquid state to fill the plurality of vertically disposed hollow column formwork structures to create vertically disposed column structural elements; and

applying structural bearing material in a liquid state to the horizontal upper exterior surfaces of the plurality of non-bearing prefabricated building units to create a single structural deck over the plurality of non-bearing prefabricated building units, and wherein there are no poured walls such that structural loads in the building are supported substantially by the structural deck and the vertically disposed column structural elements.

13. The method of claim 12 further comprising creating a second story of the building by stacking additional ones of the plurality of non-bearing prefabricated building units on top of the structural deck, such that plurality of vertically disposed hollow column formwork structures in the second story plurality of non-bearing prefabricated building units line up with the plurality of vertically disposed hollow column formwork structures in the first story.

14. The method of claim 13 wherein at least some of plurality of non-bearing prefabricated building units include a service shaft with plumbing and electrical components passing through the service shaft, and wherein said method includes installing and connecting plumbing and electrical components in the service shaft.

15. The method of claim 12 further comprising:

constructing column cages in the locations where the plurality of vertically disposed hollow column formwork structures will be located; and

wherein the step of lowering comprises lowering the plurality of non-bearing prefabricated units such that the column cages fit inside the plurality of vertically disposed hollow column formwork structures.

16. The method of claim 15 further comprising adding second story column cages to the existing column cages on the first story prior to the step of stacking additional ones of the plurality of non-bearing prefabricated building units on top of the plurality of non-bearing prefabricated building units on the base.

17. A method of constructing a building comprising:

arranging a plurality of non-bearing prefabricated modules disposed on a first level of said building, at least some of the plurality of non-bearing prefabricated modules having vertically disposed hollow column formwork structures;

pouring a concrete deck on top of the plurality of non-bearing prefabricated modules on the first level using the top of the plurality of non-bearing

prefabricated modules on the first level as permanent non-structural formwork, the concrete also filling the vertically disposed hollow column formwork structures and forming column structural elements; and

arranging a second level of the plurality of non-bearing prefabricated modules on top of the concrete deck, and wherein there are no poured walls such that structural loads in the building are supported substantially by the concrete deck and the column structural elements.

18. The method of claim 17 further comprising:

creating additional levels of said building by repeating the steps of arranging and pouring for said additional building levels.

19. The building of claim 1 wherein the vertically disposed column structural elements are formed within the plurality of non-bearing prefabricated building units.