CLAIMS

1. A pre-assembled floor-ceiling panel, comprising:

a panel frame comprising a plurality of spaced apart joists disposed between and connected to first and second opposing end members;

a ceiling panel disposed below and attached to the panel frame, wherein the ceiling panel comprises at least one pre-fabricated board of non-combustible material;

a floor panel disposed over and attached to the panel frame, wherein the floor panel comprises a plurality of stacked layers that include:

a first layer disposed above and attached to the panel frame;

a second layer disposed above and spaced apart from the first layer, wherein the first layer, the second layer, or both comprise one or more pre-fabricated boards of non-combustible material; and

a shaped substrate between the first and second layers, wherein the shaped substrate comprises a radiant heat member in a channel defined by an upper surface of the shaped substrate; and

a first mounting component attached to the panel frame, wherein the first mounting component is configured to join the floor-ceiling panel to a structural frame of a building.

2. The floor-ceiling panel of claim 1, wherein the first mounting component includes at least one bracket arranged vertically with respect to a horizontal member of the structural frame.

3. The floor-ceiling panel of claim 1, further comprising a second mounting component attached to the panel frame, wherein the second mounting component is configured to join adjacent floor-ceiling panels.

4. The floor-ceiling panel of claim 3, wherein the second mounting component includes a first angle member that extends, at least partially, along a length of the panel frame.

5. The floor-ceiling panel of claim 1, wherein the ceiling panel comprises two stacked layers of fiberglass-clad gypsum boards.

6. The floor-ceiling panel of claim 5, wherein individual fiberglass-clad gypsum boards of the two stacked layers are staggered such that seams between fiberglass-clad gypsum boards of one layer of the two stacked layers are offset from seams between fiberglass-clad gypsum boards of the other layer of the two stacked layers.

7. The floor-ceiling panel of claim 1, wherein the first layer comprises metal-clad cement board.

8. The floor-ceiling panel of claim 7, wherein a metal side of the first layer is against the panel frame.

9. The floor-ceiling panel of claim 7, wherein the second layer comprises magnesium oxide board.

10. The floor-ceiling panel of claim 1, wherein the shaped substrate comprises an insulative core and a metal sheet bonded to the upper surface, and wherein the metal sheet follows contours of the channel defined by the upper surface.

11. The floor-ceiling panel of claim 1, wherein the first layer is longer in length than the second layer, the shaped substrate, or both.

12. The floor-ceiling panel of claim 11, wherein the first layer is longer in width than the second layer and the shaped substrate.

13. The floor-ceiling panel of claim 1, wherein the floor-ceiling panel is configured to accommodate a pre-assembled wall structure along a perimeter portion of the floor-ceiling panel.

14. The floor-ceiling panel of claim 13, wherein the shaped substrate and the second layer are shorter than the first layer to define a ledge to support the pre-assembled wall panel.

15. A building including at least five stories, the building comprising:

a structural frame that includes a horizontal beam; and

a pre-assembled floor-ceiling panel disposed between two vertically adjacent stories of the building, wherein the floor-ceiling panel comprises:

a ceiling panel provided on a ceiling side of the floor-ceiling panel and that defines a ceiling of one of the two vertically adjacent stories;

a floor panel provided on a floor side of the floor-ceiling panel and that defines a floor of the other one of the two vertically adjacent stories;

a panel frame disposed between and supporting the floor and ceiling panels, wherein the panel frame comprises a plurality of joists which span a full length of a unit of the building; and

a first mounting component joined to the panel frame and that connects the pre-assembled floor-ceiling panel to the horizontal beam.

16. The building of claim 15, further comprising a unit on one story of the two vertically adjacent stories, wherein the unit comprises a floor defined by three or fewer pre-assembled floor-ceiling panels.

17. The building of claim 16, wherein the unit further comprises two opposing walls spaced by a distance, and wherein each of the three or fewer pre-assembled floor-ceiling panels spans the distance between the two opposing walls.

18. The building of claim 15, wherein the pre-assembled floor-ceiling panel comprises at least one of: a radiant heat element provided within a depth of the floor panel, or a shower pan integrated into the floor panel.

19. A method to construct a floor system for a building, the method comprising:

attaching a first pre-assembled floor-ceiling panel to a structural frame of a building;

joining a second pre-assembled floor-ceiling panel to the first pre-assembled floor-ceiling panel, wherein each of the first and second pre-assembled floor-ceiling panels comprises:

a plurality of joists,

a ceiling panel disposed below and attached to the plurality of joists,

a floor panel disposed above and attached to the plurality of joists, wherein the floor panel comprises a first floor layer disposed above and attached to a panel frame of the floor-ceiling panel, a second floor layer over and spaced from the first floor layer, and a shaped substrate provided between the first and second floor layers, wherein the shaped substrate comprises a channel and an in-floor radiant heat element received in the channel; and

a first mounting component attached to the panel frame, wherein the first mounting component is configured to join the floor-ceiling panel to the structural frame of the building; and

installing a floor finish material to the first and second pre-assembled floor-ceiling panels.

20. The method of claim 19, wherein the joining the second pre-assembled floor-ceiling panel to the first pre-assembled floor-ceiling panel comprises:

placing the second pre-assembled floor-ceiling panel next to the first pre-assembled floor-ceiling panel such that an outer joist of the first pre-assembled floor-ceiling panel is adjacent and spaced from an outer joist of the second pre-assembled floor-ceiling panel; and

joining a first angle member of the first pre-assembled floor-ceiling panel to a second angle member of the second pre-assembled floor-ceiling panel to attach the second pre-assembled floor-ceiling panel to the first pre-assembled floor-ceiling panel.

21. The method of claim 20, further comprising providing insulation in a cavity defined between the adjacent outer joists of the first and second pre-assembled floor-ceiling panels.

22. The method of claim 20, wherein the installing the floor finish material comprises attaching the floor finish material to the first and second pre-assembled floor-ceiling panels such

that the floor finish material extends over a seam between the first and second pre-assembled floor-ceiling panels.

23. The method of claim 22, further comprising installing a ceiling finish material to the first and second pre-assembled floor-ceiling panels such that the ceiling finish material extends over the seam between the first and second pre-assembled floor-ceiling panels.