CLAIMS

1. A multi-storey modular building comprising a plurality of concrete-based prefabricated modules, the building comprising:

a first concrete-based prefabricated module wherein at least a portion of the module is load-bearing, the first prefabricated module including at least two concrete-based vertical walls and at least one horizontal structure selected from a ceiling or a floor that is at least partially attached to the at least two vertical walls;

a plurality of first reinforcing attachment members connected to at least a first vertical wall of the first concrete-based prefabricated module vertical walls, each reinforcing attachment member comprising a shaped bar having periodic projections in which at least a portion of the shaped bar is embedded in the first vertical wall and at least a portion of the periodic projections extends outside the first vertical wall forming a closed loop between the projections and the wall;

a second concrete-based prefabricated module wherein at least a portion of the module is load bearing, the second prefabricated module including at least two concrete-based vertical walls and at least one horizontal structure selected from a ceiling or a floor that is at least partially attached to the at least two vertical walls;

a plurality of second reinforcing attachment members connected to at least a second vertical wall of the second concrete-based prefabricated module vertical walls, each reinforcing attachment member comprising a shaped bar having periodic projections in which at least a portion of the shaped bar is embedded in the first vertical wall and at least a portion of the periodic projections extends outside the first vertical wall forming a closed loop between the projections and the wall;

the first concrete-based prefabricated module and the second concrete-based prefabricated module being positioned adjacent to one another within a single storey of the multi-storey modular building such that the first attachment member periodic projections face the second attachment member periodic projections;

a tie bar assembly comprising plural joining bars engaging the first and second attachment members;

in-situ cast concrete embedding the first and second attachment members and filling a space between the first concrete-based prefabricated module first vertical wall and the second concrete-based prefabricated module second vertical wall.

2. A multi-storey modular building comprising a plurality of concrete-based prefabricated modules, the building comprising:

a first concrete-based prefabricated module wherein at least a portion of the module is load bearing, the first prefabricated module including at least two concrete-based vertical walls and at least one horizontal structure selected from a ceiling or a floor that is at least partially attached to the at least two vertical walls;

a plurality of first reinforcing attachment members connected to at least a first vertical wall of the first concrete-based prefabricated module vertical walls, each reinforcing attachment member comprising a base portion embedded in the first vertical wall and periodic projections extending away from the base portion;

a second concrete-based prefabricated module wherein at least a portion of the module is load bearing, the second prefabricated module including at least two concrete-based vertical walls and at least one horizontal structure selected from a ceiling or a floor that is at least partially attached to the at least two vertical walls;

a plurality of second reinforcing attachment members connected to at least a second vertical wall of the second concrete-based prefabricated module vertical walls, each reinforcing attachment member comprising a base portion embedded in the second vertical wall and periodic projections extending away from the base portion <u>wherein the reinforcing attachment member is a channel or a C-channel</u>;

the first concrete-based prefabricated module and the second concrete-based prefabricated module being positioned adjacent to one another within a single storey of the multi-storey modular building such that the first attachment member periodic projections overlap the second attachment member periodic projections in a vertical plane;

in-situ cast concrete embedding the first and second attachment members and filling a space between the first concrete-based prefabricated module first vertical wall and the second concrete-based prefabricated module second vertical wall.

~~3. The multi-storey modular building of claim 2, wherein the attachment member is a girder having triangular-shaped periodic projections.~~

~~4. The multi-storey modular building of claim 2, wherein the periodic projections of the attachment member are sinusoidal-shaped periodic projections.~~

~~5. The multi-storey modular building of claim 2, wherein the attachment member is a perforated plate, wherein perforations create periodic projections.~~

~~6.~~3.The multi-storey modular building of claim 2, wherein the attachment member is a plurality of shear studs ~~projecting from a base rod~~.

~~7. The multi-storey modular building of claim 2, wherein the attachment member is a C-channel plate.~~

~~8. The multi-storey modular building of claim 2, the first attachment member periodic projections do not overlap the second attachment member periodic projections in a horizontal plane~~

~~9.~~4.A multi-storey modular building comprising a plurality of concrete-based prefabricated modules, the building comprising:

a first concrete-based prefabricated module wherein at least a portion of the module is load bearing, the first prefabricated module including at least two concrete-based vertical walls and at least one horizontal structure selected from a ceiling or a floor that is at least partially attached to the at least two vertical walls;

a plurality of first receiving members at least partially embedded in at least a first vertical wall of the first concrete-based prefabricated module vertical walls, each receiving member including an opening for receiving a connecting member;

a second concrete-based prefabricated module wherein at least a portion of the module is load bearing, the second prefabricated module including at least two concrete-based vertical walls and at least one horizontal structure selected from a ceiling or a floor that is at least partially attached to the at least two vertical walls;

a plurality of second receiving members at least partially embedded in at least a second vertical wall of the second concrete-based prefabricated module vertical walls, each receiving member including an opening for receiving a connecting member;

the first concrete-based prefabricated module and the second concrete-based prefabricated module being positioned adjacent to one another within a single storey of the multi-storey modular building with interconnecting members received within respective first and second receiving members;

in-situ cast concrete embedding the first and second receiving members and filling a space between the first concrete-based prefabricated module first vertical wall and the second concrete-based prefabricated module second vertical wall;

wherein the first and second receiving members are C-channels; and

wherein the connecting members are perforated plates, a shear studs, or a metal bars such that the connecting members bears against lipped portions of the C-channels to prevent the first and second prefabricated modules from separating during concrete casting.

~~10. The multi-storey modular building of claim 9 wherein the first and second receiving members are channels or C-channels.~~

~~11. The multi-storey modular building of claim 9 wherein the attachment member is a perforated plate, a shear stud, or a metal bar.~~