MODULAR BUILDING PANEL

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ABSTRACT

A modular building panel having an inner frame, an exterior planar surface, an interior planar surface parallel with but separated from the exterior planar surface by the frame, a generally hollow core disposed between the exterior and interior surfaces, a first side with a longitudinally aligned incursive aperture, a second side parallel to the first side with a lateral projection congruent with the incursive aperture, the first and second sides being configured to form an interlocking joint when a lateral projection is coupled with an incursive aperture and one or more weather seals longitudinally disposed along at least a portion of the interlocking joint. The modular panels may be configured as either wall or roofing panel.
MODULAR BUILDING PANEL

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This non-provisional application claims benefit and priority under 35 U.S.C. §119(e) from co-pending provisional application Ser. No. 60/944,179, filed Jun. 15, 2007, to the instant inventor, the entire contents of which is hereby incorporated by reference as if fully set forth herein.

RELEVANT INVENTIVE FIELD

[0002] The various embodiments relate generally to building panels and more specifically to modular building panels.

BACKGROUND

[0003] Factory manufactured homes such as mobile homes, trailers and prefabricated building sections are commonly used worldwide to provide dwellings for persons having limited income means. However, these factory fabricated structures are typically deficient to withstand the effects of tropical storms. Moreover, transportation of the factory manufactured homes and/or prefabricated building sections requires large transport vehicles which add considerably to the cost at the point of installation. In many instances, prefabricated building require almost the same labor for assembly as a home build entirely on site. Therefore, an arrangement which allows the rapid installation of low cost structures would be highly desirous.

SUMMARY

[0004] The various embodiments disclosed herein address the deficiencies of the relevant art and provides examples of a modular building panel. The modular building panel comprises a quadrilateral frame, an exterior planar surface, an interior planar surface parallel to but separated from the exterior planar surface by the thickness of the frame, a generally hollow core disposed between the exterior and interior surfaces, a first lateral side with an incurvate aperture assembly, a second lateral side parallel to the first side with an incurvate projection assembly congruent with the incurvate aperture assembly, the incurvate projection assembly and incurvate aperture assembly configured to form an interlocking joint when the incurvate projection assembly is coupled with the incurvate aperture assembly. In an embodiment, a weather seal is longitudinally disposed along at least a portion of the interlocking joint.

BRIEF DESCRIPTION OF DRAWINGS

[0005] The features and advantages of the various exemplary embodiments will become apparent from the following detailed description when considered in conjunction with the accompanying drawings. Where possible, the same reference numerals and characters are used to denote like features, elements, components or portions of the inventive embodiments. It is intended that changes and modifications can be made to the described exemplary embodiments without departing from the true scope and spirit of the inventive embodiments as is defined by the claims.

[0006] FIG. 1—depicts an exemplary isometric view of a modular building panel.
[0007] FIG. 2—depicts an exemplary cross-sectional view of two modular building panels.
[0008] FIG. 3—depicts another exemplary cross-sectional view of two modular building panels being positioned for interlocking.
[0009] FIGS. 4, 4A—depicts an exemplary cross-sectional view of a base retaining arrangement for use with the modular building panels.
[0010] FIGS. 5, 5A, 5B—depicts exemplary top and cross-sectional views of a straightened “Z” bracket and a support column hold-down arrangement.
[0011] FIG. 5C—depicts an exemplary top cross-sectional view of a plurality of modular building panels installed on a foundation.
[0012] FIG. 6A—depicts an exemplary side cross-sectional view of a top cap for affixing the modular building panels to a roof structure.
[0013] FIG. 6B—depicts an exemplary side cross-sectional view of a roofing truss and related supporting hardware.
[0014] FIG. 7—depicts an exemplary isometric view of a completed structure installed on foundation.

DETAILED DESCRIPTION

[0015] The various exemplary embodiments disclosed herein provides a storm resistant dwelling or structure which is easily constructed at a predetermined location. A modular building panel forms a basic building block from which the structure is built. A generally standard foundation is prepared, typically dimensioned to the closest three foot length (leaving sufficient clearance for a pair of 4 inch columns.) The foundation may be either a raised frame or a concrete slab on which the modular building panels are to be installed. At each corner of the foundation, a support column is installed to the foundation. The support columns may be constructed from any building materials such as wood, steel, aluminum, composite fiber, etc. The spans between these four columns are filled by the modular building panels. In an embodiment, the modular building panel comprises an outer planar surface constructed from pultruded, compression molded, or otherwise pre-molded fiberglass. In another embodiment, the modular building panel comprises an outer planar surface constructed of cementitious material, for example, stucco or concrete.

[0016] In an embodiment, the exterior outer planar surface covers a planar wood structure, for example plywood which is dimensioned to span the width and the length of the modular building panel up to an incurvate projection and an incurvate aperture lateral structure or end cap. A complementary interior surface parallels the exterior surface and is separated by a hollow core space formed by a frame which lies between the interior and exterior surfaces.

[0017] In an embodiment, the interior surface likewise includes a pultruded fiberglass surface; however the thickness of the interior fiberglass surface or layer does not need to be as dense since the surface will be interior of a completed panel. Each lateral edge of the modular building panel includes either an incurvate projection or an incurvate aperture structure used to form an interlocking joint with an adjacent modular building panel. All exposed surfaces are intended to be encapsulated with fiberglass or other suitable material to ensure water resistance and protection against mold, decay and termites. In another embodiment, the interior surface is constructed from standard drywall or laminated wood.

[0018] In an embodiment, the incurvate projection structure comprises an incurvate projection assembly. The incurvate aperture structure comprises an incurvate aperture
assembly whose shape is complementary or congruent with that of the incurvate projection portion. When the incurvate projection and incurvate aperture assemblies are fully coupled together, adjoining building panels are maintained in a lateral parallel alignment. A weather seal is provided on one or both sides of the interlocking joint to prevent water and other materials from entering the interior of the completed structure. In an embodiment, the incurvate projection assembly and the incurvate aperture assembly generally extend the entire longitudinal distance between the top and bottom of the modular building panel.

[0019] The incurvate projection assembly and incurvate aperture assembly are both curved outwardly toward the exterior surface to provide structural integrity against wind loading incident on the exterior surface of the modular building panels and to prevent water intrusion into the interior of the structure formed using the modular building panels. In an embodiment, the modular building panels are elongated having approximate dimensions of 3 feet wide by 8 feet tall and 3/4 inches in thickness. All of the dimensions of the modular building panels may be varied to accommodate various structural and/or insulation requirements. For example, the modular building panels may be constructed in lengths of 12 feet for use as modular roofing panels. Otherwise, the construction of the modular building panels configured for use as modular roofing panels is essentially the same as the modular building panels used for walls with exception of a longitudinal center beam which is usually included in the modular roofing panels but not the modular building panels used for providing walls. Blocking may be provided to enhance the attachment of a roof to a wall panel or for the installation of a window.

[0020] The interior void space between the exterior and interior surfaces of the modular building panels includes an interior frame, an incurvate projection assembly and an incurvate aperture assembly affixed to the frame. The frame may be constructed of wood, wood composite or synthetic materials. Common fasteners are used to laterally join the modular building panels to other building structures using the frame as structural members. The interior void space may be filled with insulating materials, such as insulating foam’s, fiberglass, cellulose, recycled plastics and/or recycled fabric materials.

[0021] Adjacent panels are coupled together by axially rotating each consecutive panel such that the incurvate projection assembly is fully encompassed within the incurvate aperture assembly. This arrangement causes the adjacent panels to be aligned laterally in parallel to ensure that the weather seals have fully engaged the opposing parallel side surfaces of the adjacent modular building panel. In an embodiment, the thickness of the plywood used within the modular building panels is approximately three-eights of an inch. This thickness provides sufficient structural stability without adding unnecessary weight to an individual panel.

[0022] A completed wall assembly is constructed by sequentially adding modular building panels until a desired wall length has been achieved. The wall length is usually predetermined to fit within support columns installed at the corners of the intended structures foundation. Preferably, the span between the support columns has been dimensioned to minimize cutting of the modular panels. However, this is not a requirement and the modular panels may be cut to fit a non-uniform configuration.

[0023] The support columns may be constructed from pultruded fiberglass, wood or synthetic materials and is generally includes a square cross-section. The support columns are typically arranged with coupling blocks disposed at either end of the columns which allows for axial bolts to traverse through the coupling blocks and penetrate into structural members embedded in the foundation or directly to the foundation itself.

[0024] Since the wall panels are subject to flexing under wind loading, a longitudinal base cap is provided which laterally extends the length of the wall. The base cap comprises a straightened “Z” bracket dimensioned to extend beyond the thickness of the modular building panels used to generate a wall. An upward facing portion of the “Z” bracket is mounted in the interior portion of the structure. A planar horizontal portion of the “Z” bracket is mounted beneath the modular building panels forming the wall and in an embodiment, also beneath the support columns.

[0025] The “Z” brackets provide weatherproofing of the interior of the structure for any moisture that may have seeped through the wall panels during a severe storm. Each “Z” bracket includes a downward facing slot affixed to the exterior and of the “Z” bracket for draining the moisture accumulated within the base cap to the exterior of the structure formed from the modular building panels configured as structural walls. The base cap may be constructed pultruded fiberglass or other synthetic materials. In an embodiment, the base cap is configured to have dimensions of approximately 2/3 inches high, by 4/3 inches wide. The length of the base cap is determined by the length of wall to be installed. The base cap is approximately quarter inch thick.

[0026] The use of fiberglass construction materials provides several advantages including lightweight, weather durability, high strength, easily manufactured in convenient dimensions, virtually immune to pests and is easily cut to size using ordinary construction tools. However, one of ordinary skill in the art will appreciate that other building materials may be used in lieu of the fiberglass construction.

[0027] Referring to FIG. 1, an exemplary isometric view of a modular building panel is shown. In one embodiment, the modular building panel 110 comprises fiberglass matrix interior and exterior surfaces 150, 155. The modular building panel 110 comprises a generally elongated frame 170, plywood panels 160, 165 covering the forward and rearward surfaces of the frame 170 to form a hollow core 180 between the frame and the two plywood panels 160, 165. In an embodiment, the plywood panels are constructed from 3/8 inch stock and dimensioned to correspond with the dimensions of the frame 170. The frame 170 and/or the plywood panels 160, 165 may be chemically treated to prolong the life of the panels. In an embodiment, the frame 170 may be constructed from synthetic materials or tubular metal.

[0028] In an embodiment, a longitudinally aligned incurvate aperture assembly 20 is affixed to one side of the frame 170. The side opposite to the incurvate aperture assembly 20 includes a lateral projection assembly 120 affixed lengthwise to the frame 170. The surface profile of the lateral projection assembly 120 matches (i.e., is congruent with) the invaginating surface profile of the incurvate aperture assembly 20 to form an interlocking joint 5 (FIG. 2) when the lateral projection assembly 120 is coupled with the incurvate aperture assembly 20. In an embodiment, the incurvate aperture assembly and the lateral projection assembly are constructed from as synthetic material, for example, a fiberglass matrix formed by a pultrusion process. In an alternate embodiment, a synthetic material constructed from high
impact polymeric plastic may be used to form the lateral projection assembly 120 and the incurvate aperture assembly 20.

[0029] In an embodiment, the interior and exterior fiberglass matrix surfaces 150, 155 are applied by a lamination process over the outer surfaces of the plywood 160, 165 frame 170, incurvate aperture and lateral projection assemblies 120, 20 to form a unitary modular building panel 110. In an alternate embodiment, other synthetic materials such as stucco or other cementation surface is applied as an exterior surface 150. For example, Hardieboard® or equivalent masonry siding material. Likewise, the interior surface 155 may be constructed from synthetic materials such as standard drywall and/or laminated wood or wood composite materials.

[0030] In an embodiment, the hollow core 180 may be filled with an insulating material. By way of example and not limitation, satisfactory insulating materials include fiberglass fibers, polyurethane foam, Styrofoam, cellulose or Perlite composite board, polysiocyanurate foam, non-woven plastic balt. To prevent rain and other materials from traversing the interlocking joint 5, a weather seal 190 is installed at least between the exterior surface 155 and the lateral projection assembly 120. The weather seal 190 may be constructed from any number of elastomeric or polymeric materials and is dimensioned to longitudinally span the long dimension of the lateral projection assembly 120.

[0031] Referring to FIG. 2, an exemplary cross-sectional view of two modular building panels 10, 110 is shown. In an embodiment, a first modular panel 10 is coupled to a second modular panel 110 by an interlocking joint 5. As discussed above in reference to one embodiment, each modular panel 10, 110 comprises an exterior fiberglass matrix cover 55, 155 laminated over an exterior facing plywood face 65, 165. The plywood panels 65, 165 are affixed to a wooden or synthetic structural material using fasteners such as nails and/or screws which to form the frame 70, 170.

[0032] In an embodiment, the interior surfaces of each modular building panel comprises an interior fiberglass matrix cover 50, 150 laminated over a complementary interior plywood face 60, 160. The plywood panels 60, 160 are likewise affixed to the elongated frame 70, 170 with fasteners in parallel to the exterior plywood 65, 165. The interior and exterior plywood panels 60, 160, 65, 165 and frame 70, 170 form a hollow interior core 80, 180 which may be filled with insulating materials. As with other dimensional aspects of the modular building panel, the thickness of the frame 70, 170 may be varied to meet a particular structural and/or insulation requirement.

[0033] In an embodiment, the interior surfaces 50, 150 do not need to be as thick as the exterior surfaces 55, 155 since the interior surfaces will not be exposed to the external environment. Surface contouring and/or coloration may be added to both the interior and exterior surfaces 50, 150, 55, 155 to simulate typical building material contours and colors. For example, the exterior surfaces 55, 155 may be contoured and colored to resemble natural wood siding. Likewise, the interior surfaces 50, 150 may be contoured and colored to simulate textured drywall finishes. Each lateral edge of the modular building panels 10, 110 includes either a incurvate projection lateral projection assembly 120 or an incurvate aperture assembly 20 used to form the interlocking joint 5.

[0034] In an embodiment, the incurvate projection portion comprises an incurvate projection assembly 120. The incurvate aperture portion comprises and incurvate aperture assembly 20 whose shape is complementary to that of the incurvate projection portion 120. When the incurvate projection and incurvate aperture 120, 20 structures are fully coupled together, adjoining building panels 10, 110 are maintained in a generally parallel lateral alignment. A weather seal 90, 190 is provided on one or both sides of the interlocking joint 5 to prevent water and other materials from entering the interior of a completed structure. In an embodiment, the incurvate projection assembly 120 and incurvate aperture assembly 20 generally span the entire longitudinal length between the top and bottom of each adjoining building panel 10, 110.

[0035] The incurvate projection assembly 120 and the incurvate aperture assembly 20 are curved outwardly towards the exterior surfaces 55, 155 to provide water resistance and structural integrity against wind loading incident on the exterior surfaces 55, 155 of the modular building panels 10, 110. In an embodiment, the incurvate projection assembly 120 and the incurvate aperture assembly 20 are constructed by a fiberglass matrix pultrusion process and are bonded in place to the interior and exterior fiberglass surfaces 50, 150, 55, 155. In embodiments which do not use fiberglass for the interior and exterior surfaces 50, 150, 55, 155, the incurvate projection assembly 120 and the incurvate aperture assembly 20 are bonded to the frames 70, 170 and/or alternately affixed to the frames using fasteners.

[0036] In addition, portions 40, 45, 140, 145 the incurvate projection assembly 120 and the incurvate aperture assembly 20 form channels which encompass at least part of the lateral and longitudinal outer surfaces of the frames 70, 170. This arrangement provides additional structural integrity to the interlocking joint 5. The incurvate projection assembly 120 and the incurvate aperture assembly 20 may also be bonded to the frame 70, 170 to further increase the structural integrity of the interlocking joint 5.

[0037] Referring to FIG. 3, another exemplary cross-sectional view of two modular building panels 10, 100 being axially positioned for interlocking is shown. In this embodiment, the first modular building panel 10 is axially rotated 300 such that the incurvate projection assembly 120 of the second modular building panel 110 interfaces with the incurvate aperture assembly 20 such that the adjacent modular building panels 10, 110 become laterally aligned. In an embodiment, the first and second weather seals 90, 190 engage with the sealing surfaces 95, 195 formed into the incurvate aperture assembly 20.

[0038] Referring to FIG. 4, an exemplary cross-sectional view of a base retaining arrangement for use with the modular building panels is provided. In this embodiment, a concrete foundation 400 has been poured and includes a treated wood sill 425. The sill 425 provides a securing structure which can be easily attached to using common wood fasteners 410, 415. An anchor bolt 430 is provided to secure the sill 425 to the concrete foundation 430. A “Z” bracket 405 is provided which is affixed to the sill 425 using fasteners 415. The “Z” bracket 405 is used to direct any moisture which may have seeped through the interlocking joint 5 (FIG. 2) underneath each modular building panel 10 to the outside of the structure.

[0039] In an embodiment, the “Z” bracket 405 is constructed from a pultruded fiberglass matrix and is dimensioned to span the length of an installed set of modular building panels 10. In an alternate embodiment, the “Z” bracket 405 may be constructed from a polymeric material, for example polyvinyl chloride (PVC).
A vertical facing section of the “Z” bracket 405 is installed in the interior of the structure and may be used to affix each consecutive modular building panel 10 using fasteners 410 to the sill 425 and foundation 400 for added overall structural integrity. The exterior edge 407 of the “Z” bracket 405 has a downward and outward facing tongue which is used to direct moisture away from the foundation 400.

Referring to FIG. 4A, an exemplary cross-sectional view of the “Z” bracket 405 is provided. In this embodiment, the “Z” bracket 405 includes predrilled 435 and countersunk holes for affixing the “Z” bracket 405 to the foundation 400 and to one or more of the modular building panels 10.

Referring to FIGS. 5, 5A and 5B, an exemplary top and cross-sectional views of the “Z” bracket 405 and a support column hold-down arrangement is shown. In this embodiment, a support column 525 is installed on each corner of the building and is used to secure a completed wall of modular building panels 10 to the foundation 400. The support column 525 is used in conjunction with the “L” bracket 405 to ensure that the installed modular building panels 10 provide sufficient structural integrity to survive high wind loads generated by tropical storms and the like.

In an embodiment, the support column 525 is configured as a square tubular member and may be constructed from pultruded fiberglass, polymeric materials or metal construction matrix. Each support column 525 is attached to the foundation 400 by an anchor bolt 430 (i.e., concrete foundations) and a threaded union coupling 505 or a pair of opposing hold down bolts 560, 565 (i.e., wood foundation) threaded into the threaded union coupling 505. Heavy steel washers 510 are used on all bolt ends to ensure a uniform torque is achieved when the associated bolts 560, 565 are tightened.

In an embodiment, the interior of each installed support column 525 includes a block 530. The block 530 includes a metal cover plate 510 optionally having predrilled and countersunk holes 540 to allow for the easy installation of fasteners 510. The block is predrilled and slotted to allow for installation at the base location where each support column 525 is to be installed. The block 530 is dimensioned to fit snugly within the interior square dimensions of the support column 525 and is secured into the foundation 400 by tightening of the bolts 560, 565 and threaded coupling 505. Each support column 525 is then cut to approximately the same height as the modular building panels 10 and fitted over each block 530. Common fasteners 410 are used to attach the threaded union coupling 505 to the foundation 400. The block 530 may be constructed from wood or a high density plastic polymeric material.

Referring to FIG. 5B, a top cross-sectional view of one of the columns 525 is shown. In this embodiment, a pair of “L” brackets 555 is used to secure the modular building panels 10A, 1103 to the column 525. Each “L” bracket 555 is directly attached using fasteners 410 to an adjacent perpendicular face of the column 525. This arrangement forms a pair of right angle brackets to which the ends of each modular building panel 10A, 1103 are affixed. The modular building panels 10A, 1103 are likewise affixed to the “L” brackets 555 using fasteners 410. It should be noted that a certain number of the modular building panels 10A, 1103 may be constructed with only one end having an incurve projection assembly 120 or incurve aperture assembly 20. In certain of the modular building panels 10A, 1103, a wood blank 75 may be used for affixing the modular building panels 10A, 1103 to the column 525 or other structure. The “L” brackets 555 may be constructed from pultruded fiberglass or other suitable materials.

Referring to FIG. 5C, an exemplary top cross-sectional view is shown where a plurality of modular building panels 10A, 110A are installed on a foundation 400. For simplicity, only one section of the modular building panels is shown labeled in the drawing. Each modular building panel is maintained in position by each interlocking joint 5A-F and support columns 525A, 525C-D disposed at opposite ends of the panel runs 10A, 10A, 1103, 1013, 110C, 110C, 110D, 10C, 110C, 10D, 10E, 110E.

Referring to FIG. 6A, an exemplary side cross-sectional view of a top cap 605 is shown. In an embodiment, the top cap 605 is intended to attach to a wall constructed from a plurality of laterally interlocked modular building panels 10A to a beam 705 contained in the modular building panels constructed for use in roofing structures 700. The top cap 605 is dimensioned to span the thickness of the modular building panels and includes downward facing brackets 615. The brackets 615 encompass the top ends of the modular building panels 10A and allow for laterally affixing the top cap 605 to the modular building panels 10A using fasteners 410. A sloped support surface 610 is provided on the top of the top cap 605 for affixing the top cap 605 and modular building panel assembly 10A to the roofing panel 700.

In an embodiment, the sloped surface includes a predetermined pitch of approximately 5-10 degrees to allow water drainage from the roofing structure 700. The top cap 605 may be constructed from pultruded fiberglass or high density plastic polymeric materials. When installed, the top cap 605 extends the entire length of the wall.

Referring to FIG. 7, an exemplary isometric view of a completed structure installed on foundation 400 is shown. In this embodiment, the structure includes the modular building panels as both the walls 110 and roof 700. The modular building panels may be cut to size for the installation of windows 730 and doors 735. Traditional framing techniques may be used for the installation of windows 730 and doors 735 which provides any needed structural integrity potentially removed to accommodate these features.

The various embodiments described herein are intended to be merely illustrative of the principles underlying the inventive concept. It is therefore contemplate that various modifications of the disclosed embodiments will, without departing from the inventive spirit and scope, be apparent to persons of ordinary skill in the art. They are not intended to limit the inventive embodiments to any precise form described. In particular, it is contemplated that wood components may be constructed from any suitable materials such as plastic polymers and cementations siding materials. No specific limitation is intended to a particular construction material or units of measure are intended or implied. Other variations and inventive embodiments are possible in light of above teachings, and it is not intended that this Detailed Description limit the inventive scope, but rather by the Claims following herein.

What is claimed:
1. A modular building panel comprising:
an elongated quadrilateral frame;
an exterior planar surface;
an interior planar surface parallel with but separated from the exterior planar surface by a thickness of the elongated quadrilateral frame;
a generally hollow core defined by interior dimensions of the elongated quadrilateral frame; a first lateral side having an incurvate aperture assembly coupled thereto; a second lateral side parallel to the first side having an incurvate projection assembly coupled thereto; the incurvate projection assembly having a contour congruent with the incurvate aperture assembly, such that when the incurvate projection assembly is coupled with an incurvate aperture assembly of another modular building panel, an interlocking joint is formed; and, wherein the modular building panel is configurable as a wall panel or a roofing panel.

2. The modular building panel according to claim 1 wherein the interlocking joint is configured to prevent forces exerted by wind from separating an incurvate projection assembly coupled with an incurvate aperture assembly.

3. The modular building panel according to claim 1 wherein the incurvate projection assembly and the incurvate aperture assembly are configured to mate by axial rotation of the incurvate projection assembly within the incurvate aperture assembly.

4. The modular building panel according to claim 1 wherein a synthetic material is disposed upon a planar wood surface which forms the exterior planar surface.

5. The modular building panel according to claim 1 wherein a weather seal is longitudinally disposed along at least a portion of the interlocking joint.

6. The modular building panel according to claim 1 further comprising at least one beam disposed within the hollow core when configured as a roofing panel.

7. The modular building panel according to claim 1 further comprising insulation disposed within the hollow core.

8. The modular building panel according to claim 4 wherein the synthetic material comprises a pultruded or compression molded fiberglass matrix.

9. A modular building panel system comprising: a first modular building panel comprising: an elongated quadrilateral shape; a first lateral side having an incurvate aperture assembly coupled thereto; a second modular building panel comprising: an elongated quadrilateral shape substantially identical to that of the first modular building panel; and, a second lateral side having an incurvate projection assembly coupled thereto; the incurvate projection assembly congruent with the incurvate aperture assembly; and, wherein when the incurvate projection assembly is coupled with the incurvate aperture assembly, an interlocking joint is formed which maintains the first and second modular building panels in lateral alignment.

10. The modular building panel system according to claim 9 wherein the first and second modular building panels further comprise exterior planar faces configured for exterior exposure.

11. The modular building panel system according to claim 10 wherein the incurvate projection assembly and the incurvate aperture assembly are curved generally toward the exterior planar faces when the interlocking joint is formed.

12. The modular building panel system according to claim 10 wherein the exterior planar faces include synthetic exterior surfaces.

13. The modular building panel system according to claim 10 wherein the synthetic exterior surfaces is constructed from a material selected from the group consisting essentially of a fiberglass matrix, cementitious materials and polymeric materials.

14. The modular building panel system according to claim 11 wherein the incurvate joint is configured to prevent forces exerted by wind from separating the incurvate projection assembly coupled with the incurvate aperture assembly.

15. A modular building panel comprising: an elongated quadrilateral frame; an exterior planar surface; an interior planar surface parallel with but separated from the exterior planar surface by a lateral dimension of the elongated quadrilateral frame; a first lateral side having an incurvate aperture assembly coupled thereto; a second lateral side parallel to the first side having an incurvate projection assembly coupled thereto; and, wherein the incurvate projection assembly is congruent with the incurvate aperture assembly such that when the incurvate projection assembly is coupled with an incurvate aperture assembly of another modular building panel, an interlocking joint is formed.

16. The modular building panel according to claim 15 wherein the modular building panel is configurable as either a wall panel or a roof panel.

17. The modular building panel according to claim 16 wherein when the modular building panel further comprising a beam disposed at about a lateral midpoint of the modular building panel when configured as a roof panel.

18. The modular building panel according to claim 15 further comprising a Z bracket; the Z bracket dimensioned to span a thickness of the modular building panel and configured to allow attachment of the modular building panel to a foundation.

19. The modular building panel according to claim 18 wherein the Z bracket comprises an upward directed longitudinal section coupled with one end of a horizontal section; the horizontal section dimensioned to extend beyond the thickness of the modular building panel; a downward directed longitudinal section coupled with an opposite end of the horizontal section; and, a predetermined length which spans a long dimension of the assembled plurality of modular building panels.

20. The modular building panel according to claim 1 wherein the incurvate projection assembly and the incurvate aperture assembly at least partially include a fiberglass matrix construction.