An insulated wall panel, comprises a polystyrene foam block having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends, wherein the block is configured to include slots to receive a plurality of studs spaced apart and in parallel relation to one another within the block between the first and second surfaces and the two side ends so that side surfaces of the studs are not exposed. The panel may also include a first track member that is secured to a slab or building foundation and to a bottom end of the studs, and a second track member that is mounted to a top end of the studs.
INSULATED PANEL AND SYSTEM FOR CONSTRUCTION OF A MODULAR BUILDING AND METHOD OF FABRICATION THEREOF

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 61/173,231 filed Apr. 28, 2009, and incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] Embodiments of the subject invention pertain to building frames for construction of modular buildings. More specifically, the embodiments of the subject invention pertain to the assembly of insulated panels used to construct modular buildings, which panels include a plurality of studs or frame members imbedded or inserted in expanded polystyrene blocks configured or adapted to receive the studs or frame members.

[0003] The use of polymer foam panels in building construction is known. With respect to U.S. Pat. No. 5,822,940 (the "940 Patent"), there is disclosed a wall panel that includes a polymer foam block in which studs are imbedded. The foam block is configured to include a plurality of slots for receiving generally C-shaped studs; however, as shown in FIG. 33BB of the 940 Patent, the slots are formed in the foam block in such a manner that surfaces of the studs are exposed. Such a configuration may unnecessarily expose the foam block to ambient conditions. Accordingly, need exists for a wall panel constructed from a polymer foam material in which the studs are effectively sealed and/or embedded within the foam block so surfaces of the studs are not exposed.

BRIEF DESCRIPTION OF THE INVENTION

[0004] An embodiment of the invention for an insulated wall panel comprises a polystyrene foam block having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends. The block is configured to include slots to receive a plurality of studs, and each stud having a generally C-shaped configuration including a web and flanges perpendicular to the web and parallel to one another and the flanges having side surfaces. The studs are spaced apart and in parallel relation to one another within the block between the first and second surfaces and the two side ends of the block so that side surfaces of the flanges on the studs and the webs on the studs are not exposed.

[0005] In an embodiment the insulated wall panel may comprise a polystyrene foam block having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends. The block is configured to include slots to receive a plurality of studs spaced apart and in parallel relation to one another within the block between the first and second surfaces and the two side ends. A first track member has a web member secured to a building foundation and two spaced apart vertically disposed flanges that are secured to bottom ends of the studs. The block has channels formed in the bottom end thereof spaced apart and parallel to one another in which the flanges of the first track member are inserted. In addition, an elongated recess is formed in the bottom of the block between the channels and extending from one side end to the other side end, and the web of the first track member is positioned in the elongated recess. The block also comprises parallel flanges at the bottom end thereof on either side of the recess that cover the flanges of the first track member.

[0006] A second track member is provided and has a web member and two spaced apart vertically disposed flanges and the block has channels formed in the top end thereof spaced apart and parallel to one another in which the flanges of the second track member are inserted and secured to top ends of the studs. In addition, an elongated recess is formed in the top of the block between the channels and extending from one side end to the other side end of the block and the web of the first track member is positioned in the elongated recess, and the block has parallel flanges at the top end thereof on either side of the recess that cover the flanges of the second track member.

[0007] An embodiment of the invention may be described as a wall system that includes a plurality of the above-described wall panels and the studs for each wall panel are spaced inward of each side end of a respective block forming an extension on the blocks at each side end thereof wherein a notch is formed in an extension of each respective block. The notch extends from the bottom end to the top end of each block so that when two wall panels having notches therein are positioned side end to side end a volume is formed between the notches and an insert, having a configuration corresponding to a configuration of the volume, is inserted in the volume to connect the panels.

[0008] The insulated wall panel system further comprises two corner wall panels that each include two double stud assemblies and each stud assembly is disposed at a respective side ends of each of the foam blocks of the wall panels, and there being a plurality of studs disposed within each block and between the double stud assemblies. Each double stud assembly has a generally L-shaped configuration with a web and two spaced apart flanges that are parallel to one another and perpendicular to the web. Each side end of each block for a respective corner wall panel is cut to include a recess extending the height of the respective side end and to include two slots contiguous with the recess, perpendicular to the recess and parallel to one another, wherein a web of the double stud assembly is seated in the recess and flanges of the double stud assembly are seated in the slots. The two corner panels are secured to a foundation perpendicular to one another forming a corner of a building frame and the double stud assembly for each wall panel. The respective web members thereof are disposed perpendicular to one another and a bracket, having been secured to the foundation, includes a base plate secured to the foundation and two vertically disposed plates perpendicular to one another extending upward from the base plate, and wherein each vertically disposed plate is secured to a web of a respective double stud assembly.

[0009] An embodiment of the invention for a method of assembling an insulated wall panel, comprises providing a polystyrene foam block having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends; cutting a series of spaced apart slots into the block between the side ends of the block and parallel to one another, and the slots extend from the bottom end of the block to top end of the block wherein each slot includes a first slot that is parallel to the side end of the block and second slots that are contiguous with the first slot and the second slots are parallel to one another and perpendicular to the first slot and within the parallel surfaces of the block; cutting into the bottom end of the block a first pair of channels that are spaced apart and
parallel to one another and extend from one side end to the other side end of the block, wherein the first pair of channels are contiguous with the second slots; cutting into the top end of the block a second pair of channels that are spaced apart and parallel to one another and extend from one side end to the other side end of the block, wherein the second pair of channels are contiguous with the second slots; cutting into the bottom end of the block an elongated first recess between the first pair of channels, wherein the first recess extends from one side end of the block to the other side end of the block; cutting into the top end of the block an elongated second recess between the second pair of channels, wherein the second recess extends from one side end of the block to the other side end of the block; and, inserting a stud into each of the slots of the series of slots wherein each stud has a generally C-shaped configuration including a web member and two flanges parallel to one another and perpendicular to the web member, wherein the web member of a stud is inserted in the first slot and the flanges of a stud are inserted into the second slots.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] A more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof that are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not, therefore, to be considered to be limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings.

[0011] FIG. 1 is an elevational view of an insulated construction or wall panel and its components.

[0012] FIG. 2 is a top end view of the panel shown in FIG. 1.

[0013] FIG. 3 is an end view of the panel shown in FIG. 1.

[0014] FIG. 4 is a perspective end view of a stud used in the panel shown in FIGS. 1 and 2.

[0015] FIG. 5 is a perspective partial end view of polystyrene foam block having been cut to receive studs.

[0016] FIG. 6 is a partial end view of the bottom of an insulated construction panel including a bottom track member.

[0017] FIG. 7 is a partial end view of the top of an insulated construction panel including a top track member.

[0018] FIG. 8 is an exploded view of two insulated construction panels.

[0019] FIG. 9 is an elevational view of insulated shear panel assembly.

[0020] FIG. 10 is a top view of the shear panel assembly shown in FIG. 9.

[0021] FIG. 11 is a perspective partial end view of polystyrene foam block material having been cut to assembly a shear panel assembly.

[0022] FIG. 12 is a perspective partial end view of the assembled shear panel.

[0023] FIG. 13 is a corner assembly including two shear panel assemblies.

[0024] FIG. 14A is a top view of a corner bracket used for installing a corner assembly.

[0025] FIG. 14B is an elevational view of the bracket shown in FIG. 14A.

[0026] FIG. 15A is a top view of a bracket used for securing an end of a shear panel assembly.

[0027] FIG. 15B is an elevational view of the bracket shown in FIG. 15A.

[0028] FIG. 16 is an alternative corner assembly of two shear panel assemblies.

DETAILED DESCRIPTION OF THE INVENTION

[0029] A more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof that are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered to be limiting of its scope, the invention will be described and explained.

[0030] With respect to FIG. 1 there is shown an insulated wall panel 10 including a block 11 of a composite material such as expanded polystyrene foam or Styrofoam adapted for receiving metal studs 12 to construct a modular building frame. For purposes of describing the invention reference is made to a wall panel but the system or method disclosed herein may be used to construct other frame members such as floor and ceiling joists, and is not limited to a wall panel, either interior or exterior. The foam panel manufactured by Insulfoam may be used to assemble the wall panels 10 disclosed herein.

[0031] As shown the wall panel 10 includes or is secured to a bottom track 13A frame member that is mounted to a foundation slab 14 for receiving and securing the studs 12 and the foam block 11 onto the slab 14. In addition, a top track 13B frame member is mounted to the wall panel 10 as will be explained in more detail below; or, the wall panel 10 may be described as including the top track 13B frame member. Both the top track member 13B and bottom track member 13A supplemental the structural integrity of the panel 10, and the top track 13B provides a mechanism for securing other frame members to the panel 10.

[0032] With reference to the assembly of the wall panel 10, the foam block 11 is first cut according to building specifications on a hotwire cutting apparatus that is used for cutting and shaping Styrofoam. As shown in FIGS. 1, 2 and 3 the block 11 includes a first wall surface 15A and a second wall surface 15B, a bottom end 17A and top end 17B and two side ends 34A and 34B. In addition, the foam block 11 has predetermined height H, length L and width W dimensions. The foam block 11 is secured on a table associated with a hotwire cutting apparatus which includes a controller that is configured or programmed to transmit signals so that heated wires mounted on the apparatus cut the foam according to building specification data input into the database and/or program for operation of the hotwire cutting apparatus. The hotwire cutting apparatus may have a single wire that cuts the slots 27 (shown FIG. 5) spaced apart in the block 11 for receiving the studs 12; or, the cutting apparatus may include a plurality of wires that may simultaneously cut a plurality of the slots 27 at predetermined spaced intervals.

[0033] A sample stud 12 is illustrated in FIG. 4 and has a generally C-shaped configuration including a web 12A, first flanges 12B disposed perpendicular to the web 12A and returns 12C that are parallel to the web 12A. A representative cut is in a block 11 for insertion of studs is shown in FIG. 5. A wire enters the block 11 from one side 15A or 15B of the block 11 and descends downward toward the other side 15A or 15B of the block 11. The hotwire moves and cuts the block 11 responsive to commands from a controller in predetermined spaced intervals.
mined pattern forming slots 27A, 27B and 27C corresponding to the parts 12A-12C of a stud 12.

[0034] As shown in Figs. 2 and 5 the slot 27 and studs 12 have a width W that is less than the width W of the foam block 11 so the width W dimension of the stud 12 is disposed within the block 11 so that side surfaces at the side flanges 12B of the stud 12 are not exposed. For purposes of describing an embodiment of the invention, the wall panel 10 may include a block 11 that is 8" thick, 48" inches long and 8' feet high. However, these dimensions are provided by way of example and other dimensions may work for the intended purpose of the subject invention. For typical building specifications for example for a home, the studs 12 may be six inches wide so the side surfaces at the side flanges 12B of the stud 12 are not exposed as described above. As indicated above the block 11 may be composed of expanded polystyrene foam that is available at a number of different manufacturers or distributors throughout the United States. For example, construction grade expanded polystyrene is manufactured by Insulfoam headquartered in Tacoma, Wash.

[0035] As shown in Figs. 2 and 5, a mid-point of the slot 27A may be slightly offset relative to a lateral center line of the block 11 extending from side end 34A to side end 34B. In this manner the block 11 may be thicker on one side (15A) of the stud 12 than on the other side. The thicker side 15A of panel 10 may face an exterior of a building to be constructed. Panels 10 that are constructed for interior walls or frame members may not require the offset. For that matter panels 10 that may have a surface facing an exterior of a building do not require the thicker dimension; however, in a preferred embodiment the thicker dimension faces an exterior of a building.

[0036] With respect to Figs. 5, 6 and 7, there is shown that two lateral channels 28 are cut into the top end 17A and bottom end 17B of the block 11 for receiving tracks 13A and 13B respectively. The channels 28 are spaced apart and parallel to one another, and contiguous with slots 27B as shown in Fig. 5. By cutting the channels 28 there is formed an elongated insert 29 between the channels 28 at the bottom end 17A and top end 17A of the wall panel 10. In addition, about a 1/4" of the surface of the insert 29 is removed forming a recess or notch 16 in which the webs 18 of the tracks 13A and 13B are seated so 18 web is substantially flush with top and bottom ends 17A and 17A. Flanges 19 on the tracks 13A and 13B are seated in the channels 28. In addition, by cutting channels 28 in the ends 17A and 17B of the block 11 there is formed top flanges 33B and bottom flanges 33A on the block 11 that cover sides of the studs 12 and tracks 13A and 13B at respective ends 17A and 17B of the wall panel 10.

[0037] After the slots 27, channels 28 and recesses 16 are cut into the block 11, the studs 12 are inserted into the slots 12. Wall panels 10 thus assembled may be prepared for shipping to a construction site. As noted the panel 10 is secured to or includes a bottom track 13A that is anchored to a concrete slab 14 as shown in Figs. 1 and 3. The panel 10 is lifted and flanges 19 on track 13A are aligned with channels 28 in the block 11 so the elongated insert 29 and bottom end of the studs 12 are inserted into the track 13A. In order to secure the panel 10 to the bottom track 13A, the block 11 is adjusted or slid up on the studs 12 so the flanges 19 on the bottom track 13A are exposed to secure the bottom of the studs 12 to the track 13A using fastening mechanisms known to those skilled in the art. An adhesive may also be applied to the surfaces of the track 13A, track flanges 19 and/or slab 14, and the block 11 is then adjusted downward on the studs 13A so the bottom flanges 33A on the block 11 abut surfaces of the track flanges 19, track 13A and slab 14. The adhesive helps secure the block 11 in place on the panel 10 or slab 14 and seals an interface between the flanges 33A, track 13A and slab 14. An adhesive that may be used includes QB4500, which can be purchased at any one of a number of home repair or home supply stores such as Home Depot® and Lowes®.

[0038] The top track 13B is then secured to a top end of the panel 10 and studs 12. As shown in Fig. 7, the flanges 19 on the top track 13B are inserted in the channels 28 on a top end 17B on the wall panel 10, so the insert 29 and top ends of the studs 12 are inserted in the track 13B. Fasteners are then driven through the foam block 11, flanges 19 on the top track 13 and the top ends of the studs 12. The length of the top tracks 13A or bottom tracks may vary from the length of the panel 10 (or shorter) or longer to connect together more than one panel 10. At the junction of two top tracks 13A a strap or fastener is provided to secure together the tracks 13A.

[0039] In an embodiment, and as shown in Figs. 1 and 2, a wall panel 10 has a plurality of studs 12 embedded in the foam block 11 so that studs 12 are spaced inward of side ends 34A and 34B of the block 11 forming foam block extensions 35A and 35B at each side end 34A and 34B of the panel 10. By way of example, a panel 10 may be forty-eight inches wide including three studs 12 imbedded in the block 11 and spaced sixteen inches apart, with a stud 12 spaced about eight inches from each respective side end 34A and 34B of the block 11.

[0040] With respect to Fig. 8, there is illustrated a top exploded view of the junction of two panels 10. Notches 37 are formed in the extensions 35A and 35B preferably during the hotwire cutting process. When panels 10 are aligned and end to end on a track 13A, notches 37 are also aligned forming volume 37A between the panels 10. An insert 38 is then inserted in the volume 37A defined by the notches 37 to aid in securing side by side panels 10 together. An adhesive, such as the above-referenced QB4500, is preferably applied to the ends 34A and 35B, including at the notches 37, of panel 10 before the insert 38 is positioned in the volume 37. While adjacent notches 37 and inserts 38 of the embodiment shown in Fig. 8 have a cross-sectional rectangular/square configuration, the invention is not limited to this geometric configuration, and other known configurations may be used. The foam column 38 preferably has the same geometric configuration as the volume 37 so surfaces of the foam block 11 and column 38 abut one another and application of an appropriate adhesive aids is securing panels together. The foam insert 38 preferably has the same geometric configuration as the volume 37 so surfaces of the foam block 11 and column 38 abut one another and application of an appropriate adhesive aids is securing panels together.

[0041] With respect to Figs. 9, 10 and 11 there is illustrated a shear wall assembly 36 having ends 34A and 34B to which an end 34A or 34B of an insulated wall panel 10 may be secured. The shear wall assembly 36 includes a foam block 11' that has been cut, as described above, to include slots 27 for receiving or inserting studs 12. In addition, the side ends 34A and 34B have been cut to form a recess 41 (see FIG. 11) to receive the double stud assembly 40 at the respective ends 34A and 34B of the block 11'. As shown in Figs. 10 and 12, the double stud assembly 40 has a generally I-shaped configuration and includes a web 40A and two flanges 40B that are parallel and spaced apart relative to one another and perpendicular the web 40A. In addition each end of the flange
may include a return 40C (totally four returns in this example. The double stud assembly may include two studs that abut one another at their respective webs A and are affixed to one another using fasteners such as bolts or rivets, for example. Alternatively, the stud assembly 40 may be fabricated as a single structural frame member including the components of two web-to-web abutting studs.

In FIGS. 11 and 12 there is shown a block 11' having been cut to receive studs 12. Slots 42B and 42C are cut into the ends 34'A and 34'B of the block 11' to receive respective flanges 40B and returns 40C of the stud assembly 40. In addition, a channel 41 is formed along the height H of the block 11' at each end 34'A and 34'B to receive the web 40A and remainders of the double stud assembly 40 so that returns 40C are substantially flush with the respective ends 34'A and 34'B of the block 11'.

In addition, as shown in FIGS. 11 and 12 diagonal channels 43 are preferably cut into both sides 15'A and 15'B of the block 11' for receiving straps 44. As shown, the channels 43 extend diagonally across the face of shear wall assemblies 36 from a top end of one of the double stud assemblies 40 positioned at a top corner of the assembly 36 to a bottom end of the other double stud assembly 40 positioned at a bottom corner of the assembly 36. Once the double stud assemblies 40 are in place, the straps 44 are inserted into the channels 43 and affixed to the double stud assemblies 40. The strips of foam that have been removed for placement of the straps 44 may be placed over the straps 44 to cover the straps. Adhesive may be used to secure these strips in place. As assembled, the shear wall assembly 36 is ready for shipment to a construction site.

For both the insulated wall panel 10 and the insulated shear wall assembly 36 after the panels are assembled the panel surfaces may be finished to include a cementious or stucco, or other type of wall surface finishing. Typically, a nylon wall mesh may be affixed to the wall surfaces to support a selected wall finishing, so the panels are ready for shipment to a construction site.

In reference to FIG. 13, there is shown a corner assembly 45 that includes two shear wall assemblies 36 affixed to the slab 14 and to one another. The corner assembly 45 includes the ends (34'A or 34'B) of the shear wall assemblies 36 forming a corner of a building, and a corner stud 47 that is bolted to one of the stud assemblies 40 of a shear wall assembly 36. A bracket 46 is anchored to the slab 14 and also bolted to each of the double stud assemblies 40 of the shear wall assemblies 36.

As shown in FIGS. 14A and 14B the bracket 46 includes a base plate 51 having one or more apertures 51A to secure the bracket 46 to the slab 14. In addition, the bracket 46 includes two vertical plates 49A and 49B that are disposed perpendicular to one another, and each have one or more apertures to affix the bracket 46 in abutting relationship to each of shear wall assemblies 36 at the respective double stud assemblies 40. More specifically, the vertical plates 49A and 49B are secured to the respective webs 40A of the respective studs 40. The volume between the corner stud 47 and the shear wall assemblies 36 is filled with a foam column that is inserted at the corner formed at the junction of the two shear wall assemblies 36.

In addition, brackets 48 are used to anchor the double stud assemblies 40 of the shear wall assemblies 36 distal the corner assembly 45. As shown in FIGS. 15A and 15B, the bracket 48 is L shaped having one single vertical plate 52 secured to the web 40A of the stud assembly 40, and a base plate 50 that is anchored to the slab. When a panel 10, as shown in FIG. 1, is to be secured on the slab 14 and abutting a shear wall assembly 36, a foam insert is positioned in the stud 40, of stud assembly 40, facing the panel 10. An adhesive, such as the above-referenced QB4500 is applied to any exposed surface of the foam insert or stud assembly 40 and preferably to an end 34A or 34B of the panel 10. The end 34A and 34B of the panel 10 is positioned in abutting contact with the shear wall assembly 36 to secure the panel 10 to the shear wall assembly 36 and to the slab 14. In this manner, a panel 10 is secured to the shear wall assembly 36. In addition, the panels 10 are secured together as described above forming an exterior and an interior framework for a building.

With respect to FIG. 16, two shear panel assemblies 36 have been assembled and are positioned relative to one another to form a corner as shown in the drawing. The bracket 46 may be orientated and secured to the stud assemblies 40 as shown. During assembly, the bottom sections of the foam panel 11 at the corner may be cut away or removed to positioned and secure the bracket 46 to the stud assemblies. While the preferred embodiments of the present invention have been shown and described herein, it will be obvious that such embodiments are provided by way of example only. Numerous variations, changes and substitutions will occur to those of skill in the art without departing from the invention herein. Therefore, it is intended that the invention not be limited to the particular disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims.

What is claimed is:
1. An insulated wall panel, comprising:
   a polystyrene foam block having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends, wherein the block is configured to include slots to receive a plurality of studs, and each stud having a generally C-shaped configuration including a web and flanges perpendicular to the web and parallel to one another and the flanges having side surfaces, wherein the studs are spaced apart and in parallel relation to one another within the block between the first and second surfaces and the two side ends of the block so that side surfaces of the flanges on the studs and the webs on the studs are not exposed.
2. The insulated wall panel of claim 1, further comprising a first track member having been secured to a building foundation and the first track member having a web member secured to the foundation and two vertically disposed, spaced apart and parallel flanges, and the bottom end of the foam block has two parallel channels formed therein to receive the flanges of the first track and the flanges of the first track are secured to a bottom end of the studs.
3. The insulated wall panel of claim 2, wherein the slots formed in the block include a first slot that is contiguous with two second slots that are spaced apart and parallel to one another and perpendicular to the first slot to receive the web member and the flanges of the stud.
4. The insulated wall panel of claim 3, wherein the channels formed in the bottom end of the block are contiguous with the second slots that receive the flanges on the studs.
5. The insulated wall panel of claim 3, further comprising a second track member secured to a top end of the studs and the second track member having a web member and two
Vertically disposed, spaced apart and parallel flanges wherein the top end of the foam block has two parallel channels formed therein to receive the flanges of the second track, and the flanges of the second track member are secured to a top end of the studs.

6. The insulated wall panel of claim 5, wherein the channels formed in the top end of the block are contiguous with the second slots that receive the flanges on the studs.

7. The insulated wall panel of claim 2, further comprising an elongated recess formed in the bottom end of the block between the channels and the web member of the first track member is seated in the recess and the flanges of the first track member are seated in the channels, and the block having flanges adjacent the channels covering the flanges of the first track member.

8. The insulated wall panel of claim 5, further comprising an elongated recess formed in the top end of the block between the channels and the web member of the second track member is seated in the recess and the flanges of the second track member are seated in the channels, and the block having flanges adjacent the channels covering the flanges of the second track member.

9. The insulated wall panel of claim 1, wherein the panel includes two double stud assemblies and each stud assembly is disposed at a respective side end of the foam block, and there being a plurality of studs disposed within the block and between the double stud assemblies, wherein each double stud assembly includes two studs abutting one another at webs of the studs and are secured to another, wherein each side end of the block having been cut to include a recess extending the height of the respective side end and to include two slots contiguous with the recess, perpendicular to the recess and parallel to one another, wherein a web of the double stud assembly is seated in the recess and flanges of the double stud assembly are seated in the slots.

10. The insulated wall panel of claim 9, wherein two such insulated wall panels are secured to a foundation perpendicular to one another forming a corner of a building frame and the double stud assembly for each wall panel and the respective web members thereof are disposed perpendicular to one another and a bracket, having been secured to the foundation, includes a base plate secured to the foundation and two vertically disposed plates perpendicular to one another extending upwardly from the base plate, and wherein each vertically disposed plate is secured to a web of a respective double stud assembly.

11. The insulated wall panel of claim 9, wherein the block is further configured to include two diagonal channels formed in the first and second surfaces of the block, and each of channels extending from a top end of one double stud assembly to a bottom end of the other double stud assembly and intersecting therebetween, the channels being formed for receiving straps that are secured to the respective top and bottom ends of the double stud assemblies.

12. The insulated wall panel of claim 1, wherein the studs are offset relative to a lateral centerline of the block, and the block having a thickness dimension on one side of the studs that is greater than a thickness dimension on the other side of the studs, wherein the thicker side of the block is disposed on an exterior side of a building.

13. The insulated wall panel of claim 1, wherein studs are spaced inward of each side end of the block forming an extension of the block at each side end thereof wherein a notch is formed in an extension of the block and the notch extends from the bottom end to the top end of the block so that when two wall panels having notches therein are positioned side end to side end a volume is formed between the notches and an insert, having a configuration corresponding to a configuration of the volume, is inserted in the volume to connect the panels.

14. An insulated wall panel, comprising:

- a polystyrene foam block having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends, wherein the block is configured to include slots to receive a plurality of studs spaced apart and in parallel relation to one another within the block between the first and second surfaces and the two side ends;
- a first track member having a web member secured to a building foundation and two spaced apart vertically disposed flanges that are secured to bottom ends of the studs and the block having channels formed in the bottom end thereof spaced apart and parallel to one another in which the flanges of the first track member are inserted, and an elongated recess formed in the bottom of the block between the channels and extending from one side end to the other side end, and the web of the first track member is positioned in the elongated recess, and the block having parallel flanges at the bottom end thereof on either side of the recess that cover the flanges of the first track member, and;
- a second track member having a web member and two spaced apart vertically disposed flanges and the block having channels formed in the top end thereof spaced apart and parallel to one another in which the flanges of the second track member are inserted and secured to top ends of the studs, and an elongated recess formed in the top of the block between the channels and extending from one side end to the other side end of the block and the web of the first track member is positioned in the elongated recess, and the block having parallel flanges at the top end thereof on either side of the recess that cover the flanges of the second track member.

15. The insulated wall panel of claim 14, wherein each stud has a generally C-shaped configuration including a web member and two spaced apart parallel flanges attached to the web member and perpendicular thereto, and wherein the slots formed in the block extend from the top end to the bottom end of the block and include a first slot in which the web of the stud is inserted and the first slot is contiguous with two second slots that are spaced apart and parallel to one another and perpendicular to the first slot and in which the flanges of the stud are inserted, and wherein the channels on the bottom end and top end of the block are contiguous with the second slots.

16. The insulated wall panel of claim 14, wherein the panel includes two double stud assemblies and each stud assembly is disposed at a respective side end of the foam block, and there being a plurality of studs disposed within the block and between the double stud assemblies, wherein each double stud assembly includes two studs abutting one another at webs of the studs and are secured to another, and the block is further configured to include two diagonal channels formed in the first and second surfaces of the block, and each of channels extending from a top end of one double stud assembly to a bottom end of the other double stud assembly and intersecting therebetween, the channels being formed for receiving straps that are secured to the respective top and bottom ends of the double stud assemblies.
17. The insulated wall panel of claim 14, wherein the studs are offset relative to a lateral centerline of the block, and the block having a thickness dimension on one side of the studs that is greater than a thickness dimension on the other side of the studs, wherein the thicker side of the block is disposed on an exterior side of a building.

18. A method of assembling and installing an insulated wall panel, comprising:

providing a polystyrene foam block having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends;

cutting a series of spaced apart slots into the block between the side ends of the block and parallel to one another, and the slots extend from the bottom end of the block to the top end of the block and wherein each slot includes a first slot that is parallel to the side ends of the block and two second slots that are contiguous with the first slot and the second slots are parallel to one another and perpendicular to the first slot and within the parallel surfaces of the block;

cutting into the bottom end of the block a first pair of channels that are spaced apart and parallel to one another and extend from one side end to the other side end of the block, wherein the first pair of channels are contiguous with the second slots;

cutting into the top end of the block a second pair of channels that are spaced apart and parallel to one another and extend from one side end to the other side end of the block, wherein the second pair of channels are contiguous with the second slots;

cutting into the bottom end of the block an elongated first recess between the first pair of channels, wherein the first recess extends from one side end of the block to the other side end of the block;

cutting into the top end of the block an elongated second recess between the second pair of channels, wherein the second recess extends from one side end of the block to the other side end of the block; and,

inserting a stud into each of the slots of the series of slots wherein each stud has a generally C-shaped configuration including a web member and two flanges parallel to one another and perpendicular to the web member, wherein the web member of a stud is inserted in the first slot and the flanges of a stud are inserted into the second slots.

19. The method of claim 18, further comprising:

securing a first track member to a building foundation wherein the track member includes a web member that is secured to the building foundation and two spaced apart parallel flanges that are perpendicular to the web member of the track member;

positioning the block, with studs having been inserted therein, on the first track member with the flanges of the track member being inserted in the first pair of channels and the web of the first track member seated on the first recess;

positioning a second track member, having a web member and two spaced apart parallel flanges that are perpendicular to the web member of the second track member, on the top end of the block with the flanges of the second track member being inserted in the second pair of channels and the web member of the second track member is seated in the second recess, and

securing the flanges of the first track member to bottom ends of the studs; and,

securing the flanges of the second track member to top ends of the studs.

20. The method of claim 19, further comprising:

cutting a first pair of channels into the first surface of the block wherein the first pair channels are diagonally disposed on the surface and intersect;

cutting a second pair of channels into the second surface of the block wherein the second pair of channels are diagonally disposed on the surface and intersect;

inserting a strap into each channel on the first surface and each channel on the second surface; and,

securing each strap to a top end of a stud and/or a flange of the second track member and to a bottom end of a stud and/or a flange of the first track member.

20. The method of claim 19, further comprising:

cutting a notch into a side end of the foam block for a first wall panel wherein the notch extends from the bottom end of the block to the top end of the block;

cutting a notch into a side end of a foam block for a second wall panel wherein the notch extends from the bottom end of the block to the top end of the block;

positioning the first wall panel adjacent to the second wall panel wherein notches on the respective wall panel face each other forming a volume therebetween; and,

inserting a polystyrene foam insert into the volume to connect together the first and second wall panels.

22. The method of claim 21, further comprising applying an adhesive to the surface of each end of the block for the respective first and second wall panels at the notches and/or applying the adhesive to the insert.

23. An insulated wall panel system, comprising:

a plurality of polystyrene foam blocks each having first and second parallel surfaces, top and bottom parallel ends and two parallel side ends, wherein each block is configured to include slots to receive a plurality of studs spaced apart and in parallel relation to one another within the block between the first and second surfaces and the two side ends and the blocks are aligned side end to side end;

a plurality of first track members each having a web member secured to a building foundation and two spaced apart vertically disposed flanges that are secured to bottom ends of the studs and the blocks having channels formed in the bottom end thereof spaced apart and parallel to one another in which the flanges of the first track members are inserted, and an elongated recess formed in the bottom of each block between the channels and extending from one side end to the other side end, and each web of the first track member is positioned in the elongated recess, and the blocks having parallel flanges at the bottom end thereof on either side of the recesses that cover the flanges of the first track members; and,

a plurality of second track members each having a web member and two spaced apart vertically disposed flanges and the blocks having channels formed in the top ends thereof spaced apart and parallel to one another in which the flanges of the second track members are inserted and secured to top ends of the studs, and an elongated recess formed in the top of each block between the channels and extending from one side end to the other side end of each block and the web of each first track member is positioned in the elongated recess, and
each block having parallel flanges at the top ends thereof on either side of the recesses that cover the flanges of the second track members.

24. The insulated wall panel system of claim 23, studs for each wall panel are spaced inward of each side end of a respective block forming an extension on the blocks at each side end thereof wherein a notch is formed in an extension of each respective block and the notch extends from the bottom end to the top end of each block so that when two wall panels having notches therein are positioned side end to side end a volume is formed between the notches and an insert, having a configuration corresponding to a configuration of the volume, is inserted in the volume to connect the panels.

25. The insulated wall panel system of claim 23, further comprising two corner wall panels that each includes two double stud assemblies and each stud assembly is disposed at a respective side ends of each of the foam blocks of the wall panels, and there being a plurality of studs disposed within each block and between the double stud assemblies, wherein each double stud assembly includes has a generally I-shaped configuration with a web and two spaced apart flanges that are parallel to one another and perpendicular to the web, wherein each side end of each block for a respective corner wall panel having been cut to include a recess extending the height of the respective side end and to include two slots contiguous with the recess, perpendicular to the recess and parallel to one another, wherein a web of the double stud assembly is seated in the recess and flanges of the double stud assembly are seated in the slots.

26. The insulated wall panel system of claim 24, wherein the two corner panels are secured to a foundation perpendicular to one another forming a corner of a building frame and the double stud assembly for each wall panel and the respective web members thereof are disposed perpendicular to one another and a bracket, having been secured to the foundation, includes a base plate secured to the foundation and two vertically disposed plates perpendicular to one another extending upward from the base plate, and wherein each vertically disposed plate is secured to a web of a respective double stud assembly.

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