Autoclaved aerated concrete panels, and method of making and using such panels, specifically for the construction of residential homes, where the panels feature first and second faces having widths of at least two feet.
TYPICAL WALL SECTION

1" = 1'-0"

NOTE:
WATER PROOF COATING APPLIED TO ROOF PANEL
ANGLE LINTEL

LINTEL PER SCHEDULE
8" AAC WALL PANEL

OPENING PER PLAN

WALL TIES PER CODE

OPTIONAL BRICK OR STONE

KEY PER SCHEDULE

SLAB ON GRADE

TYPICAL WALL W/BRICK

1/2" x 1'-6"
SECTION AT DORMER WINDOW

$\frac{3}{4}'' \times 1' - 0''$
SECTION AT DORMER WINDOW

\[ \frac{1}{2}'' = 1''-0'' \]
Figure 8

Typical floor/wall section at basement wall

1/2" = 1'-0"

Note:

Or typical floor & wall section w/ waterproof all below grade AAC & basement wall.
WALL PARALLEL TO EDGE OF FLOOR PANEL

1/2" = 1'-0"
STAIRS

6" x 6" AAC CORBEL
OR
ANGLE IRON

GROOVE CUT & SLIDE
MC BLOCK DOWN
NAIL IRON TO
REST ON PREVIOUS
BLOCK WITH THIS END
MORTAR + ANCHOR.

FOR AAC CORBEL NOTCH
CUT AAC BLOCKS
AND STACK BLOCKS
USING MORTAR + ANCHOR.
Fig 12

AAC ANCHOR SCREW

SELF COUNTER SINKING

+16"

MORTAR ALL JOINTS+SEAMS USING QUICK SET EPOXY SUPER STRONG CURE < 12 HOURS

SCALE 1/3" = 1"

THIN/WIDE THREAD ALLOWS FOR MOST HOLDING POWER AND MINIMUM AAC EFFECT

USE GUIDE SIMILAR TO BLACK+DECKER SCREW SET FOR POWER DRILLS TO SET ANCHORS. LARGE PLATE HELPS PLUMB TOP VIEW

HOLLOW FOR ACC TO RELEASE

SQUARE HEAD FOR USE W/ STRONG DRILL OR MECHANICS AIR RATCHET.
**Fig. 13**

**TOOLS + TEMPLATE GUIDE**

**HEAVY DUTY**

**RECIPROCATING SAW**

**GUIDE**

**GUIDE PLATE**

Which is exactly (2")

Same distance from cutting blade in every direction so operator simply holds plate against template guide.

**Saw channels allow saw to be completely detached so blade is not protruding through guide plate, thus can inserted into AAC in line with template guide.**

**Template guide is dual U bars wi holes for screwing into place.**

**Template can expand and retract to 69" (4'-3")**

**Dimensions, screw holes lay above window frame.**

**Small overlap of 3" is inconsequential.**

**Standard sized niches for windows + doors.**

**BLADE IS EXTRA THICK AND STRONG SO STAYS PERFECTLY STRAIGHT THROUGH 6-12" AAC AND CAN STAY CUTS...**

**SPECIAL SAW ENABLS BLADE TO STAY CUTS.**

**TEETH DESIGN ESPECIALLY FOR AAC.**

**Cut #1.**

1 + 1/2" + 1/4" + 1/2" + 1/4" NOT BREAK AAC.
UTILITY CHANNEL
ROUTING TOOL

3/8 or 5/8" BLADE FOR WIRE & PLUMBING CHANNELS

1/2" BLADE FOR OUTLETS.

DUST BAG CATCHES ALL AAC DUST.

PLUNGE ROUTER

AAC HEMI-CENT PLATE
GUTTER DOWN SPOUT

ROOF PANELS

HORIZONTAL ROOF PANEL

WATER

CURVE/SLOPE BOTTOM FORCE WOTZL OUT FRONT

ROOFS BREAK UP W/ MOLD SO SORT OF FALLING

ETC.
NEW PANEL END DESIGN FOR WATER RUNOFF
NOT JUST A "FANCY CUT," ACTUALLY PART OF ABAC SYSTEM.
F16 17

SEAM ROLLER
AAC IMPRINT

AT PANEL JOINTS
THE SEAM WILL HAVE
MORTAR WHICH IS FIRST
SCRAPED OFF AND
IMMEDIATELY IMPRINTED
W/ SEAM ROLLER
SO NO JOINT/SEAM IS
DETECTABLE.

SPECIAL AAC PATTERN
AUTOCLOVED AERATED CONCRETE PANELS AND METHODS OF MANUFACTURING, AND CONSTRUCTION USING, AUTOCLOVED AERATED CONCRETE PANELS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates generally to autoclaved aerated concrete panels, and methods of making and using such panels, and specifically to residential home construction using autoclaved aerated concrete panels.


[0004] Autoclaved aerated concrete was discovered in the early 1900's and is a mixture of cement, aluminum powder, lime, water and finely ground sand. This mixture expands dramatically, and this "foamed" concrete is allowed to harden in a mold, and cure in a pressurized steam chamber, or autoclave.

[0005] Commercial production of autoclaved aerated concrete (AAC) began in the 1930's, and recently more than 31 million cubic meters were produced by over 50 factories worldwide. The construction industry has sought alternative building techniques in order to limit the traditional expenses of construction, including the high energy costs, increasingly expensive construction labor and equipment, and a higher environmental consciousness of home owners. These factors have forced home builders in particular to search for new construction materials. These new materials have to be versatile, easy to use, durable, and energy efficient. AAC appears to satisfy the demands of such a superior construction material.

[0006] AAC is used in a wide range of building construction with residential, commercial and industrial buildings being common applications. Autoclaved aerated concrete is as workable as wood, and can easily be cut, shaped or routed to accommodate almost any design criteria. Conventional uses of AAC are as small masonry-like units, or blocks. The walls, floors and roof of an AAC building are constructed with a plurality of these blocks.

[0007] There are several advantages to construction methods using autoclaved aerated concrete blocks as they have low weight per unit, beneficial insulative characteristics, are non-toxic, non-combustible and water resistant. Another advantage to AAC is its environmental friendliness.

[0008] AAC weighs 30% less than traditional concrete masonry units. Standard 8" concrete masonry units weigh approximately 38 lbs/unit. Alternatively, 8" AAC blocks weigh approximately 28 lbs/unit. Per square foot, standard 8" concrete masonry units weigh 42.8 lbs/square foot as compared to 21 lbs/square foot for 8" AAC blocks. Due to the light weight of AAC, reduced equipment demands also are realized.

[0009] AAC buildings are very energy efficient. This efficiency is due to a combination of high R-value, thermal mass and air-tightness. AAC is the only product currently available that meets Germany's stringent energy codes without added insulation. It is well documented that the R-value of a mass product need not be as high as that of light frame construction, to perform thermally efficient. A recent study in the U.S. shows that an 8" AAC wall performs much better than a conventional wood stud wall system with R-30 insulation.

[0010] Due to AAC's excellent insulation qualities, energy consumption for the heating and cooling of buildings built from AAC is greatly reduced compared to most conventional wall and roof systems.

[0011] In the AAC manufacturing process, no pollutants or toxic by-products are produced. AAC is an inorganic material that contains no toxic substances. Due to its inorganic structure, AAC also eliminates the food source condition required to be present for microbial growth to occur.

[0012] Further, AAC is non-combustible, so in the case of fire it can help prevent the fire from spreading to other rooms. During a fire, no toxic gases or vapors are ever emitted from inorganic AAC.

[0013] AAC does not slowly decompose and off-gas. Thus, AAC is resistant to water penetration and decay.

[0014] AAC is also widely known as an environmentally friendly construction material. Compared to the energy consumed in production of many other basic building materials, only a fraction of this energy is required to produce AAC. Raw material consumption is very low for the amount of finished product produced. Since AAC is both a structural and insulation material, it allows for the elimination of other materials both as an environmental benefit and as limiting any poor indoor air quality due to construction material other than AAC. AAC is also completely recyclable.

[0015] As another advantage, field mistakes easily can be corrected. Conventional screws and nails can be used with AAC. For heavy loads, fasteners similar to those used for concrete block are utilized.

[0016] AAC products are unfinished. Depending on the building use or the aesthetic requirements, AAC may be coated with an interior or exterior surface finish. On the exterior stone veneers, brick veneer, wood siding, vinyl siding or metal sidings may all be easily attached to AAC. In addition, an AAC interior usually has sheet rock installed, and may be wallpapered after a skim coat of plaster or gypsum-based material is applied.

[0017] Although AAC construction is superior to conventional systems, the current methods of use for AAC residential construction are self-defeating, and actually prevent AAC from becoming the residential industry standard.

[0018] Therefore, a need exists in the art for AAC panels, instead of blocks, and manufacturing and construction methods using AAC panels that not only overcome many of the problems of current AAC production and use, but also become such an asset in and of themselves that by their implementation alone (apart from all of AAC's inherent attributes), AAC could become the industry standard due solely to ease and time savings in construction. It is to the provision of such panels and manufacturing and construction methods that the present invention is primarily directed.

SUMMARY OF THE INVENTION

[0019] Accordingly, the present invention includes novel AAC panels, a method of manufacturing these AAC panels, and a method of construction using the AAC panels. The
AAC panel and methods of manufacturing and construction necessitate the production and use of novel tools and related equipment and subsystems, which themselves are further parts of the present invention.

The present invention provides a radically new use for AAC in residential construction, which system is far superior to prior art and conventional wood and steel frame construction in many ways. The present invention requires a new manufacturing process and a completely new installation process for residential construction, and certain commercial applications. From the initial and long term environmental impact, through the entire construction process, to the end user and home owner, the present system eradicates many, if not all, the current obstacles in the prior art of AAC blocks, and the use of AAC, which are preventing AAC from replacing wood/steel and becoming the home construction industry’s standard material.

One aspect of the present invention is a monolithic panel of AAC, instead of the conventional small block, for residential applications, or conventional 2' blocks for commercial constructions. The present AAC panels are monolithic walls, floors and roofs, so initially there are no more than one joint/seam per panel, and ultimately by fully implementing current methods of manufacture and construction, there are no seams/joints in the present panel of AAC measuring 8' by 10'.

The present invention also provides a new two- to three-story monolithic wall panel. The present invention incorporates numerous new design principles and concepts. For example, novel floor panel supports, self-supporting roof subsystems and whole panel exterior walls from which all openings are cut are provided, beyond just a new panel design.

No one has ever manufactured and constructed a residential/commercial structure which is truly habitable by modern standards and economically viable using monolithic structural panels of the present invention from which openings for windows and doors are cut after installation.

The present method of manufacture comprises the manufacture of new dimensional panels (for walls, roofs and floors) instead of the current 2' wide blocks, the panels being monolithic AAC walls measuring 8' tall and 10' wide, and further having no seams. By modifying current manufacturing systems, the same wall has no more than one seam.

Use of the present panels necessitates novel construction methods. A residential home of the present system does not require insulation, roofing materials, sheat-rock, exterior sheathing or gutters. The present construction system preferably uses only one material to build nearly the entire structural and insulation part of a building, AAC, which offers many advantages, including allowing excellent design flexibility, quick construction and reduced waste.

Further, the present construction system includes a roofing subsystem that incorporates a unique self-supporting ridge beam thus requiring no truss system, wherein conventional truss systems leave unusable attic space.

The present construction system produces an entire house from the foundation up (including, but not limited to, exterior and interior walls, basements, roof, interior floors, cam levered decks and fireplaces). The house is built solely of AAC panels in such a manner that an average 1,800 square foot house using the present construction method can be completely constructed on site within two long working days using a small crew (depending on size and design of home), instead of the several months and myriad of specialized crews that are currently required.

The present construction system is much more than just modular construction AAC, as the entire current system is unique in details and the overall symmetry creates a distinct product which prior art forms of block could not have combined to make. The prior art forms of commercial blocks can require the use of cranes, but have never approached anything remotely similar to present invention despite 70 years of manufacture and construction of AAC! For one thing, the prior art never recognized the problem of competing with conventional residential construction using AAC in another form, namely panels. Manufacturers and builders using prior art blocks used solely in commercial construction never recognized the problem that the blocks were not monolithic, although the blocks were, in fact, used to construct what in the end result was similar to a monolithic structure.

The concept of a present house is that it can almost be completely prepared at the factory in terms of walls, floors, and roof system. This is how Solomon built the temple in Biblical records 1 Kings 6:7. It is then shipped by semi tractor-trailer that has a crane unit. Foundation at the site is prepared. The driver is also crane operator and simply erects the house with licensed crew. A 2,000 square foot house is completely set up, and the roof waterproofed.

The next day, all exterior finishes are applied, and door and window openings are cut. Windows and doors can be set immediately. There are no mechanical reasons once the slab/foundation is prepared that an entire 2,500 square foot house cannot be built and finished (except for interior such as H/A, plumbing, kitchen cabinets, bath fixtures, floors as hardwood, tile, carpet, etc.) within one week.

All exterior and interior finishes are still possible so that each home can have a custom look and “home” feel. Brick, stone and even wood treatments are possible on the exterior. On interior finish all standard materials can be used so that no one will know difference except for lower mortgage payments, quietness, lower utility bills and no fear of termites or fire destroying the home.

There is also no waste material from the construction as all panels and parts of panels are reused in applications for site improvement and other environmentally friendly uses.

Tools

Use of the present panels also necessitates new tools. New custom tools designed strictly for the present AAC panels and methods are used, including routers that catch all the dust for electrical (which boxes will be round), wiring installation (where panels do not use present manufacturing of conduit in panels or run in joints and then covered with mortar), AAC connector wall plates and a
special design reciprocating saw used in conjunction with template guide for cutting openings in solid wall panels.

[0038] To join AAC panels together, mortar joints are used in addition to uniquely designed screws that are large and have a thread flange that is very wide and with distance between so they do not crush AAC but go deep and anchor well.

[0039] Benefits

[0040] No one has ever manufactured and constructed a residential/commercial structure which is truly habitable by modern standards and economically viable using monolithic structural walls from which openings for windows and doors are cut after installation.

[0041] One advantage never before appreciated is the fact a 2,000 square foot home can be constructed in less than half the current time at a greatly reduced labor cost of prior art AAC construction methods.

[0042] The present methods of construction using autoclaved aerated concrete overcomes numerous problems in the conventional residential construction market. The producers of AAC have had failure in breaking into the residential market due to current manufacturing and installation methods. One such problem is that there exists no installation method for AAC that is cost-effective, as producers heretofore have not recognized that construction revolutions dictate changing present manufacturing processes, designs, and construction systems for residential construction. Producers simply implement various improvements upon the prior art AAC “block” method.

[0043] The present system solves a problem that historically all companies in AAC (i.e.: Hebel, YTONG, Matrix and ACCO) have not successfully overcome, even after monumental investments. So much so that a Mr. Angelo Coduto of ACCO, an expert in AAC and responsible for bringing two AAC producers to America, said in November 1999, “We only do commercial because residential is too difficult to be successful.”

[0044] Other experts in AAC construction identify the very problems the present invention overcomes. Mr. Roger Babb of Babb International said on Jan. 18, 2000, “the problem of expense lies in the required finish of interior and exterior walls.” Babb International’s new “state of the art plant”, consists of prior art “block” designs, (though “trying new block ideas”), not large panels.

[0045] The present invention further reduces costs by eliminating blocks and the required extra surface coats of heavy stucco and sheet-rock. For example, the present construction method incorporates the use of spray paint-type coatings and paints that are water proof but allow beading action on the roof panels, in order to replace costly and environmentally unfriendly industry standard asphalt shingles.

[0046] The construction system of the present invention also removes the dependence on huge elements of blocks, wood and/or steel roof systems, interior walls and floors, while actually increasing capability.

[0047] The desire for a quality home that has the inherent advantages of AAC has not been financially feasible and competitive until the present invention of large panels, and the method of construction using such panels and the related synergism of all the various components. Now it is available to everyone, not just the rich. The present invention solves the long-felt, long-existing and unsolved need for affordable, economically feasible mass marketing of durable, insulate, termite proof housing that is extremely environmentally friendly in view of materials used, waste of materials and when current materials exhaust themselves the problem of landfills (roof shingles, etc.).

[0048] The present construction system is completely contrary to teachings of the prior art in that even the most innovative and yet-to-be-built AAC plants are still based on block systems instead of larger panels, and conventional construction methods.

[0049] Synergism exists in the present invention for numerous reasons. First, the present invention has never been expressly suggested or implied by previous art. Why else would every modem and yet-to-be-built plant costing $10,000,000’s advertise the use of prior art “block” manufacturing? Further, the prior-art references could never be combined physically to achieve same idea. The references alone or in combination do not teach or suggest the invention. The prior art references do not operate if combined in a manner remotely similar to the present system, for example lintels/headers are required above windows and doors in previous art uses of blocks, but in the present form none are required.

[0050] For residential applications, a YTONG engineer was quoted that “Roof panels are not used with block walls (as in residential, panel walls are not known to be used by anyone now) due cost issues and breakage. Only on an expensive custom home.” In addition, YTONG’s anchoring system of floor and roof panels to block walls are completely different from the present construction, and YTONG details require prior art steel truss systems.

[0051] The prior art method of construction of a residential home is awkward, separate and involves numerous steps as the use of many blocks using manual labor, the roof system being wood or steel, and floor systems requires a different, inferior method. The present system transcends the whole field in current usage and application, and requires an entirely new approach distinct and separate from current construction techniques.

[0052] The present approach is from the opposite end of the spectrum and only practical and feasible by the invention of manufacturing large panels and/or the new unique construction methods and tools.

[0053] AAC is a superior material to conventional wood, concrete and steel, and the only reason AAC has not replaced other building materials is because no one thought of the current ideas for panels, manufacturing and constructing.

[0054] These and other objects, features, and advantages of the present invention will be more apparent upon reading the following specification in conjunction with the accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0055] FIG. 1 illustrates the prior art AAC blocks and the AAC panels of the present invention according to a preferred embodiment.
FIG. 2 shows a roofing subsystem according to a preferred embodiment of the present invention.

FIG. 3 illustrates opening details according to the present invention, including windows and doors.

FIG. 4 shows a wall subsystem according to a preferred embodiment of the present invention.

FIG. 5 shows a wall subsystem of the present invention with a brick face.

FIG. 6 is a dormer detail according to the present invention.

FIG. 7 is a sectional view of a dormer window of the present invention.

FIG. 8 is an illustration of floor and wall at the basement detail according to a preferred embodiment of the present invention.

FIG. 9 is a wall to floor detail of the present invention.

FIG. 10 is a wall to floor corbel detail.

FIG. 11 is a stairway of the present invention.

FIG. 12 is a detailed view of an anchor screw according to the present invention.

FIG. 13 shows tools and a template guide according to present invention.

FIG. 14 shows a channel routing tool.

FIG. 15 illustrates a roofing subsystem according the present invention having a gutter and downspout.

FIG. 16 is an end roof panel water run off design of the roofing subsystem of FIG. 15.

FIG. 17 is a seam roller (AAC finish imprinted in mortar joints) according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now in detail to the drawing figures, wherein like reference numerals correspond to like parts throughout the several views, the present invention is a novel construction system including AAC panels, a method of manufacturing AAC panels, a method of construction using AAC panels, and related AAC panel tools and devices.

Panels

The presently disclosed AAC panels can be used in a variety of ways, including as walls, floors and roofing. The new panels can be custom cut at a plant for each specific use, for example, as walls, floors, and roof systems. The new panels preferably are 5' wide panels, and can be 8' wide panels, the depth and height of the panels being variable as to strength requirements each application; i.e., walls, floors, roofs, etc.

The walls of the present invention are new dimensional panels instead of the current 2' wide blocks. The AAC panels are monolithic walls so when laid horizontally, the panels constitute a wall with no seams/joints in a standard wall of AAC measuring 8' high by 10' long. Immediate implementation in existing plants creates a wall with only one seam/joint in a wall measuring 8' high by 10' long.

In another embodiment, ACC panels can be placed vertically side to side and reach two+ stories high, creating the first true two+ story monolithic wall panel. This can be coordinated using a corbel notch (FIG. 4). This embodiment is an advantage over the prior art use of individual wall panels for each floor level.

The present wall panels are unique in that they do not require a thick stucco coat on the exterior or drywall on the interior to hide unsightly block lines, as the solid wall panels preferably have limited joint lines that are easily grouted smooth with an AAC seam roller according to the present invention (FIG. 17).

The present walls can incorporate electrical conduit and plumbing pipes in them to ease electrical and plumbing installation, (FIG. 3). Such walls would allow an electrician to simply route into plastic conduit and then pull wires. Plumbing routes allow one simply to find the pipe and then solder pipes together. Since AAC is fireproof, there is no problem with torch use with the present walls.

Manufacture

The current method of manufacturing monolithic AAC panels versus prior art blocks directly affects floor and roof panels. There is simply no relationship nor remote likeness of the present manufacturing process to previous methods of AAC block designs (Prior Art 1).

An example of prior art is when the inventor visited the Hebel plant in Adel, Ga., to explore the present method which he conceived in August 1999. The Hebel plant was being fit to try a "new experimental idea" in December 1999, of fixing two 2' panels together for commercial use. As opposed to this attempt, the present manufacturing process provide unique whole-wall type panels that are larger than current 2' blocks.

The present roof and wall manufacturing system is based on the ability of two panels of AAC to rest immediately on each other with no other prior art construction material (i.e.: prior art wood, steel, etc.) required. This may include a unique manufacturing of interlocking notches so the entire structure is interlocking. After mortar and anchors, the structure becomes monolithic (FIG. 2).

There are no other known uses of pitched residential AAC roof panels that rest directly on AAC walls. Prior art designs were forced to use other materials (Prior art 2) or flat roofs in commercial use. The present interlocking system uses mortar and new screws to permanently join roof panels and wall panels. A machine at the manufacturing plant can custom cut the panels in angles and lengths, and notch panels, so they set flush on the wall and notch and ridge beam.

The conventional manufacture techniques use blocks of AAC of 2' widths of nominal sizes (i.e.: 12"x24"). There are no known manufacture process of panels greater than 2' width. The present invention proposes to modify the prior art designs to be altered to cut 5' wide panels with nominal dimensions instead of prior art industry standard 2'. The manufacturing process is ultimately to be altered by cutting material into 8' wide panels instead of current 2' wide. This is possible by modifying current building systems (FIG. 1) to 5' widths and future plans of producing standard 8' wide panels with nominal dimensions.
Presently a piano wire is dragged end to end through AAC to cut AAC into various thicknesses. As shown in FIG. 1, another novel manufacturing process involves a wire that can make a motion to assist cutting and as required have a plastic sheet attached which breathes to facilitate autoclave process. Wire and plastic sheet are dragged through the AAC from side to side. The wire has an eyelet and plastic sheet attached so that wire can be released from the cutting machine and the plastic stays with AAC through the autoclave process to keep AAC panels separated. After the autoclaving process, the sheets are removed and used again.

Manufacturing of AAC ridge beams is also a new idea.

Manufacturing roof panels including exterior ends required the roof panels be routed so that water runoff is facilitated, and this coordinates with current integrated roof gutter systems. It also provides “curb” appeal for all exterior ends of roof panels to be manufactured with the present water runoff design that functions through an ornamental routing. (FIGS. 4 and 16).

Construction

One construction method according to the present invention is a wall and floor subsystem using a 6"x6" AAC corbel to interlock ACC wall panels with a notch placing a corbel in the field. This new construction process enables one continuous wall panel to span two stories, something never done in AAC before. (Cf Prior art 5). The present art had only blocks and when panels were used commercially the panels spanned only one story and the floor was placed between them. The current construction process allows for greater structural integrity and much less installation time.

Another construction method is a roofing subsystem using new interlocking AAC ridge beams that make possible an entire roof system composed of AAC, again something before not considered. Interlocking AAC ridge beams and roof and wall panels become one monolithic component after mortar and anchoring. (Cf. Prior art 3 and 4). The present interlocking system uses mortar and new screws to permanently join roof panels and wall panels.

Walls, due solely to manufacturing constraints of the prior art, are a new idea as 5 wide panels, which go the height of the wall from the foundation to the roof. The present invention also contemplates walls of 8+ as they can be turned on edge and run custom lengths up to 20+ and various thickness. Since mortar is stronger than AAC itself, all wall joints are self-bonding (as with welding metal). New ideas of corner panel joints simply “anchored” with new design screws (FIG. 13) and mortared, or additionally, they can be routed on the top edge of panels to receive an angle brace. The entire wall system is erected on a slab or foundation wall for basements. In some cases AAC can be used in the basement and waterproofed, allowing for a ranch design home with a basement using this current idea two story wall panels. Wall panels are shipped to sight solid as manufactured and all window and door openings are cut at site.

There are no lintels or headers used over doors and windows in the present construction system since the new walls have masses and integral strengths unlike prior art walls (FIG. 3). In the rare instances, the most required is a mull for large openings.

All openings, for example, windows and doors, are cut at site out of solid wall panels using a uniquely designed special template guide and reciprocating type saw. (FIG. 14). The “waste” pieces from cut out window and door openings are then used for site improvements such as stair treads, retaining walls, fence columns and entire privacy wall systems. Pieces can be ground by special machine and with dust from routers and saws is simply sewn into soil. There is no waste!

Walls have a manufactured notch, and a corbel is installed in the notch by mortar and anchor, and then the AAC floor panel is placed to rest on the corbel and is anchored to wall system. This eliminates elaborate and expensive prior art system of rebar, felt, dowel, ring beam and reinforcing bars (Prior art 5).

The present construction method allows for the first true two-story wall panels.

Further, wood crown molding is attached to the corbel at the top and bottom for interior finish; therefore AAC corbel is actually integrated into crown molding design as one unit. Fake corbels can be installed on other walls to compliment.

In respect to the floor construction, the floor is supported by a notch cut at the factory or site, and then, at the site, a 6" square corbel (FIG. 4) is mortared into the notch and anchored from the outside wall. Floor panels are lowered by a crane into the structure’s erected wall area and laid on the corbel. Gaps are mortared and floor panel is anchored.

Floor panel openings can be cut at site for stairways and other needs. Scraps from the stair opening can be used to construct stairs. The stairs themselves are built using a new idea (FIG. 10). Electrical wires and plumbing are then placed in floor joints or chases drilled and installed by a set-up crew member who is a licensed electrician/plumber and then pressure grouted while placing panels.

Roof panels are manufactured and processed at the plant in such a way they are preferably mirror/matching, producing a new roof design system that is self-supporting after being anchored and mortar set (FIG. 2). They are anchored to the wall and ridge beam system. Roof panels are attached to AAC wall panels and AAC ridge beams to form the roof subsystem, a self-supporting roof preferably comprised solely of AAC. This system is unique in that it eliminates the prior art’s wasted attic space. Further, AAC’s innate quality of superior insulation does not require additional insulation. The present roofing subsystem is also unique in that prior art roofs require using a myriad of other construction materials (Prior art 2 and 3), not just AAC.

The present construction method includes the use of special screws installed in one easy, quick act to attach AAC panels to each other (as well as ridge beams, corbel and others). This replaces the following prior art steps and materials: drilling a hole in both surfaces, placing epoxy in holes and then inserting by hand either dowels or reinforcing bars. (Prior art 5).

Additional benefits of the roof are no soffits nor eaves are needed, and roof panel ends are manufactured with routed design so they are attractive. Special waterproof coatings that breathe are used for roof finish instead of
asphalt shingles, which is very environmentally friendly and a huge cost and maintenance savings.

[0102] There are no gutters per se in the present roof, as routed channels in the roof panel direct water to travel to a hole cut into the roof for down spouts (FIG. 4). The down spouts are short ornamental boxes which simply deflect water away from house walls. Since AAC does not rot, and the present house does not have the prior art’s problems of many cracks and seams, even in extreme winds that may blow water against house is of no real consequence (FIGS. 15 and 16). “Curb” appeal designs include exterior ends of roof panels be manufactured with water runoff capacity in ornamental routing. (FIG. 16). The present roofing sub-system does not require soffits or roof ventilation. Further, the fireplace, chimney and flue are all AAC. Skylights, too, are simply cut into a roof panel.

[0103] Down spouts are less than 16” long boxes that have an internal design of curves with grooves that direct water away from house walls. (FIGS. 15 and 16). The ornamental fixtures can be designed to compliment architectural theme of house (contemporary, Victorian, etc.) (FIGS. 15 and 16). Current down spouts remove need for architecturally distracting, costly down spouts running down exterior walls.

[0104] The entire roof can be laid on the floor, and then through computer generating lengths and angles, measure off and angle cut all roof panels and number them so when crane installs they just fit in place.

[0105] Tools

[0106] Specially designed anchoring screws (FIG. 12) that have self boring tips and extra wide threads that are spaced further to give extraordinary holding power for softer AAC, will be used to fasten all such plates and attach panels to panels.

[0107] Tools

[0108] Special reciprocating saws and blades which can cut regular AAC and steel reinforced AAC are used to cut openings in walls panels. (FIG. 13). Openings are marked and then a special template guides is placed on the AAC panel to be cut (FIG. 13). Special routers that catch all the resulting dust are used for grooves and receptacle openings, and special round receptacles and covers are used (FIG. 14).

[0109] Any figure not expressly referred to herein, (not including those figures depicting the prior art) disclose various aspects and embodiments of the present invention.

[0110] While the invention has been disclosed in its preferred forms, it will be apparent to those skilled in the art that many modifications, additions, and deletions can be made therein without departing from the spirit and scope of the invention and its equivalents, as set forth in the following claims.

1. An autoclaved aerated, solid, concrete construction panel having a predetermined thickness with first and second faces, where said faces are at least two feet in width.

2. The construction panel according to claim 1, wherein said faces are at least five feet in width.

3. The construction panel according to claim 1, wherein said faces are from two to ten feet in width.

4. The construction panel according to claim 1, wherein said panel includes at least one conduit.

5. The method of constructing a structure fabricated of solid, autoclaved aerated, concrete panels, where the panels have a predetermined thickness with first and second faces, each said face having a width of at least two feet, said method comprising:

   a.) providing plural said panels; and,
   b.) forming a wall with said panels, where said panels are oriented horizontally.

6. The method according to claim 5, wherein said panels have a width of at least five feet.

7. The method according to claim 5, wherein said panels have a width between from two to ten feet.

8. The method according to claim 5, including the further steps of providing a notch in at least one of said wall panels, and placing a corbel in said notch.

9. The method according to claim 5, including the further step of placing a floor panel fabricated of autoclaved aerated concrete atop said corbel.

10. The method according to claim 5, including the further step of providing an opening in at least one of said plural panels.

11. A roofing system for a structure, said system comprising the steps:

   a.) selecting a wall panel fabricated of a solid, autoclaved aerated, concrete, where said wall panel has a predetermined thickness and a width of at least five feet;

   b.) orienting said wall panel to form a wall of said structure;

   c.) selecting a roof panel fabricated of a solid, autoclaved aerated, concrete, where said roof panel has a width of at least five feet; and,

   d.) interlocking said wall panel to said roof panel.

12. The roofing system according to claim 11, including the further step of routing said roof panel to provide a path for liquids falling on said roof panel.

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