FPH

Frame Panel House

adelco

Adelco Company, active in north Italy in the construction field (civil and industrial) has recently entered in the international market, with particular attention to the new economies such as South America and Africa, exporting its knowhow to meet the new and changed housing needs in some of these countries.

This is why was founded Adelco Engineering Ghana Ltd, a building firm active in central Africa, mainly in the capital of Ghana, Accra, where it has its main office. Adelco Ghana is specialized, among the rests, in the marketing of a new building system, the Frame Panel House (FPH) based on a self-bearing prefabricated panel, patented in Italy by Mr. **Enrico AIME**.

Thanks to the experience gained in Italy and abroad, we conceived and realized a building envelope designed to satisfy big scale productions, to minimize the costs and to meet the demand of high quality products, with the internationally renowned standards of the **MADE IN ITALY**.

FPH
Frame Panel House

The characteristics and peculiarities of the new building system are the real solution because they assure best results in terms of minimizing costs, building solidity and durability.

The FPH panel has been tested in July 2014 by the **Laboratoire du Batiment et des Travaux Publics (Laboratory for Building and Public Works) in Abidjan (Ivory Coast)** in order to approve its production and its introduction into the Country. The panel testing has been the result of an agreement between Adelco and a group of Ivorian investors for the production and the marketing of the FPH system in Ivory Coast. The panel has undergone through several severe tests – transpiration, heat resistance, fire reaction and resistance to bending - giving excellent results, thus demonstrating the very good quality of the product and of its components.

FPH

Economy. Each building component is completely prefabricated in plant, roof included. The electric and water systems are totally built in fitted out panels. During the assemblage, it is sufficient to connect the panels electrically and to install bathroom fixtures as well as widows and doors.

Construction time frame. It can be assembled and finished – once the stall is made – in three working days by a team of three experts using a telescopic lift of Manitou type.

Security. We took care of the security issue as well. Every entry, windows and doors in each house have been provided with security grilles to avoid thefts when the house is vacant or during the night.

Strength and durability. The building assemblage is obtained by connecting several male and female frames made of hot deep galvanized steel (the structure) and finished with different materials in the external and internal parts. Outside, the panel is coated with fibre reinforced plasterwork while inside it is covered by two different panels, an OSB panel and a plasterboard panel on the outer part. Internally it is injected with hot polyurethane foam. Thanks to the hot polyurethane foam, the panels are extremely solid and, once assembled, they assure to the building the same or even a better resistance to that of concrete blocks buildings.

Health and comfort. The building is raised from the ground either by a crawlspace either by Krinner type screws. It is insulated both in the walls and in the cover, thus offering pleasant climate to its residents – without air conditioning – even in very bad weather conditions.

Soundproofing. The polyurethane injected into the sandwiched panels serves not only as heat insulation but also as soundproofing, thus providing a better quality life to its residents.

Customization. The versatility of the modular construction system allows a great level of customization in the arrangement of the internal rooms (extreme freedom in the design of the house spaces) as well as in the finishing materials and in the design of the panels (internal and external).

On site production. A very important characteristic of the FPH system rely on the fact that its panels are made in a "production island" consisting of two multiple press with double trays and one hot polyurethane injector machine that it is installed directly in the country or even on the site where the houses are to be assembled (in case of an order of at least thousand houses). This means creating new jobs opportunities for the local people and introducing technologies and know-how in the country.

FPH layering

Internal finishing: made of plasterboard, variable thickness.

OSB (Oriented Strand Board) panel.

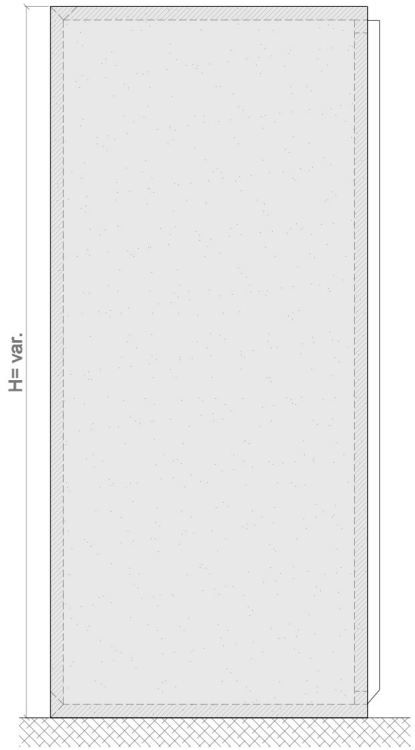
Insulation: heat insulation layer made of hot injected polyurethane foam, variable thickness.

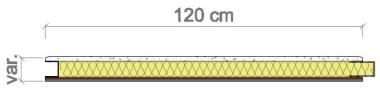
Galvanized steel: galvanized steel 1,5 mm. thick fixed to the frame to sustain the reinforced concrete.

External finishing: made of reinforced concrete 1,5 cm thick.

Metal Structure

FPH description





The FPH building system is realized by assembling, through male and female joints, prefabricated panels whose standard width is 120 cm. and whose height may change according to the construction needs.

The panel has a galvanized steel framework whose thickness is variable (2 mm. is the standard).
Also the panel's thickness (and thereby the insulation) can be adapted to the need of a specific project, starting from 6 cm. - the minimum necessary to maintain the panel's good heat capacity - upto greater thickness, in order to provide better energetic performances in different climatic conditions.
A galvanized steel plate 1 mm. thick is welded on the external part of the framework through electric spot welding. On the plate is fixed a wire net that is receiving and supporting the fibre-reinforced plasterwork that is the framework's external skin.
The internal side of the panel has two layers, a structural one made of OSB (Oriented Strand Board) and a finishing one, exposed, made of plasterboard. The OSB not only functions as thermal insulation but also allows any furniture to be solidly anchored to the walls.

Window panel

Window

Electrical system panel

Inspection box

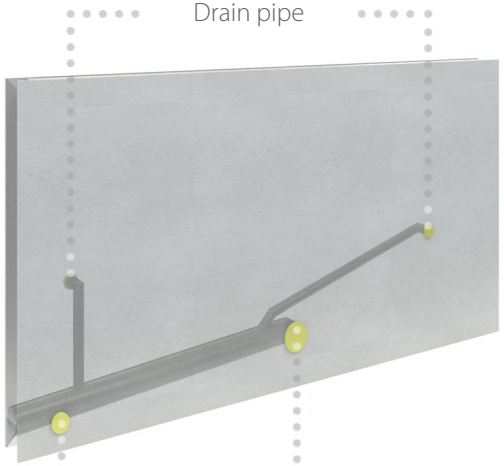
Electrical tubings

Lightning set up

Box with electrical plug socket set up

Box with electrical switches set up

Water Panels



Drain pipe

Shower siphon

WC siphon

Housing types

The FPH system is suitable for self-sufficient constructions - one or two storeys buildings up the ground realized by FPH panels assemblage both for vertical and horizontal partitions - or, in alternative, can be used as infill walls combined with a load bearing structure in reinforced concrete or steel, for two or more storeys buildings.

Conceived as self-bearing, the panel can be used as internal or external wall, as floor or ceiling and each one can be studied and designed according to the project's needs and to the functions of the building.

The self bearing construction can be two storeys at its most and the model of panel used to build the slab between the floor has different load bearing capacity according to the case, while for multi-storeys buildings a mixed construction is used.

Considering its versatility, FPH system is adapted to the construction of different building types from civil houses to hotels and resorts, from schools to sanitary buildings, from police stations to administrative buildings, from shopping centres to religious buildings, from public toilets to social centres.

The modularity of the system gives also extreme freedom to the architectural design, allowing various building solutions according to the Client's need.

Following some of our proposals:

X3 house

This building is the result of an interdisciplinary and interprofessional research led by a pool of professionists (architects, engineers and sociologists) and insiders (entrepreneurs and precast home developers) to meet the demands of the increasingly fervent African reality.

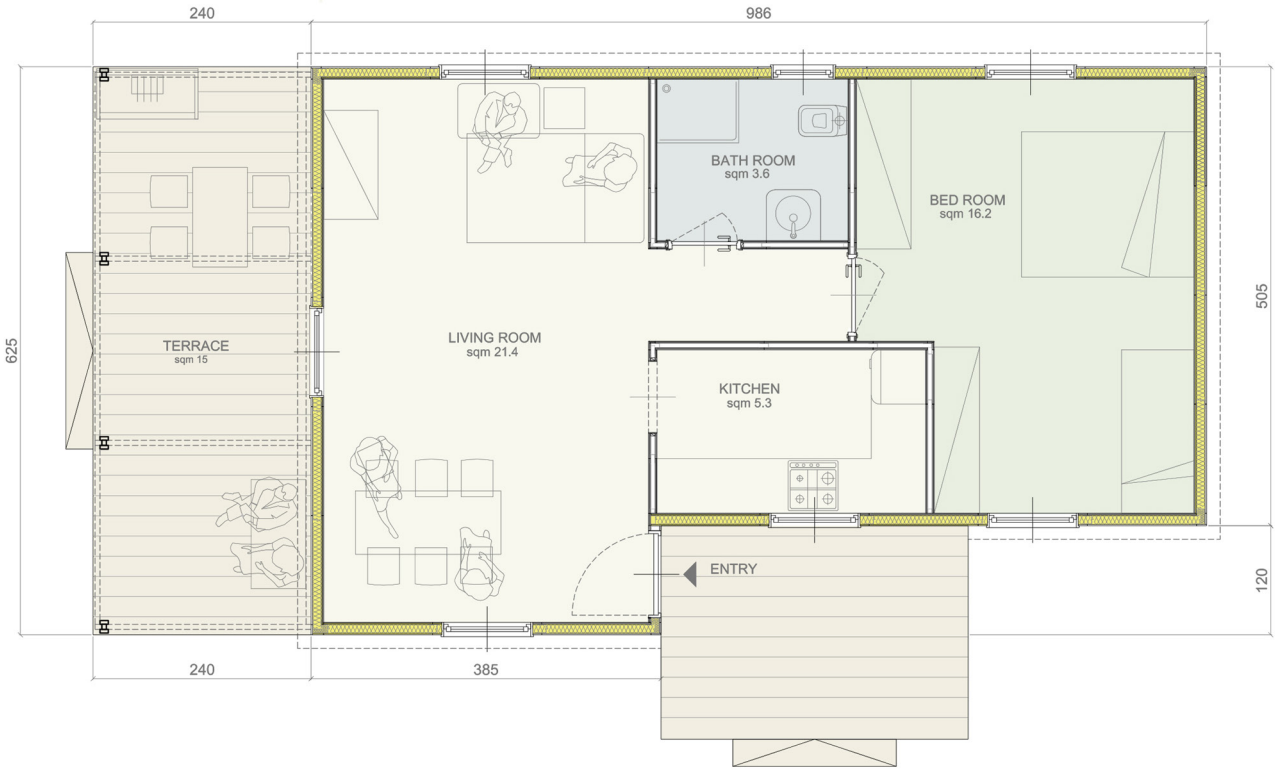
The project has the goal of delivering a product – the home – that, due to the urbanization process, is nowadays an emergence in most of the African countries. Following precise demands by some local promoters, the house has been designed to meet the African needs and, at the same time, to harmonize as much as possible with the environment and the local culture.

In addition, the aim is to provide an high quality product at a very competitive prize for a large scale demand, thus challenging the Chinese building standards that imposed themselves in the African market, often with products of very low quality.

We came therefore to a very interesting proposal with three different developing steps: the basic is the one bedroom house, the XS House; by adding to it a first block with one room and a bathroom we get the HM House; finally attaching another block with a third room we obtain the HL House.

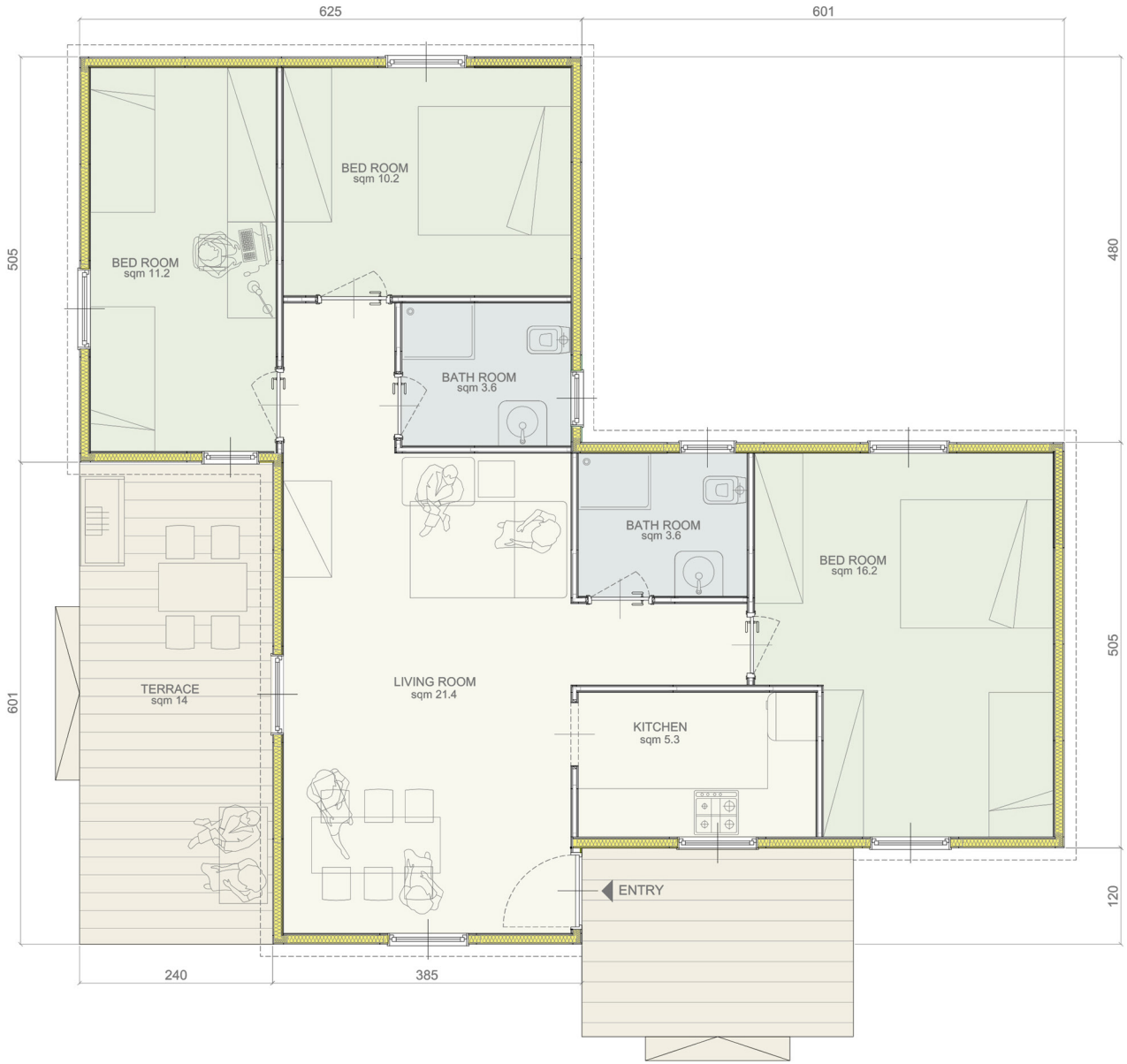
It becomes thus possible to meet different demands according to the economic resources of each client.

X3 one bedroom



X3 two bedrooms

X3 three bedrooms



BH basic house

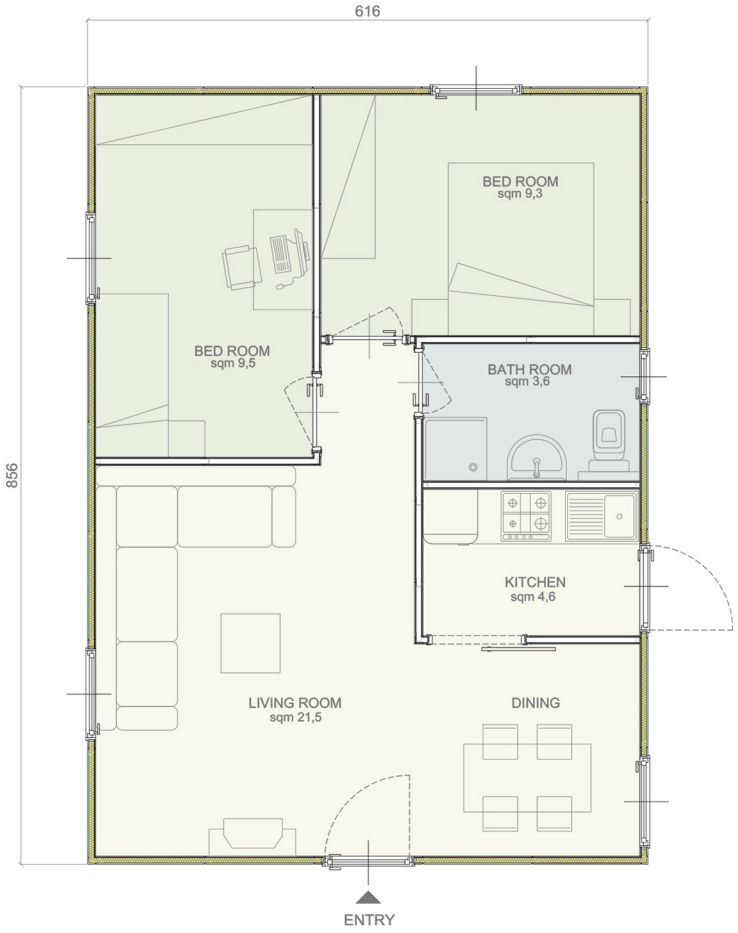
The BH project is characterized by a simple plan house (hence the prototype name), with a rectangular plant that includes a living room with separate kitchen, a bathroom and 2 bedrooms. This compact composition has the advantage of reducing the costs, resulting in a very competitive price.

The internal height is 270 cm covered with a dual pitched roof in galvanized metal sheet, fully aerated with especially conceived timber tympanums in brise soleil style.

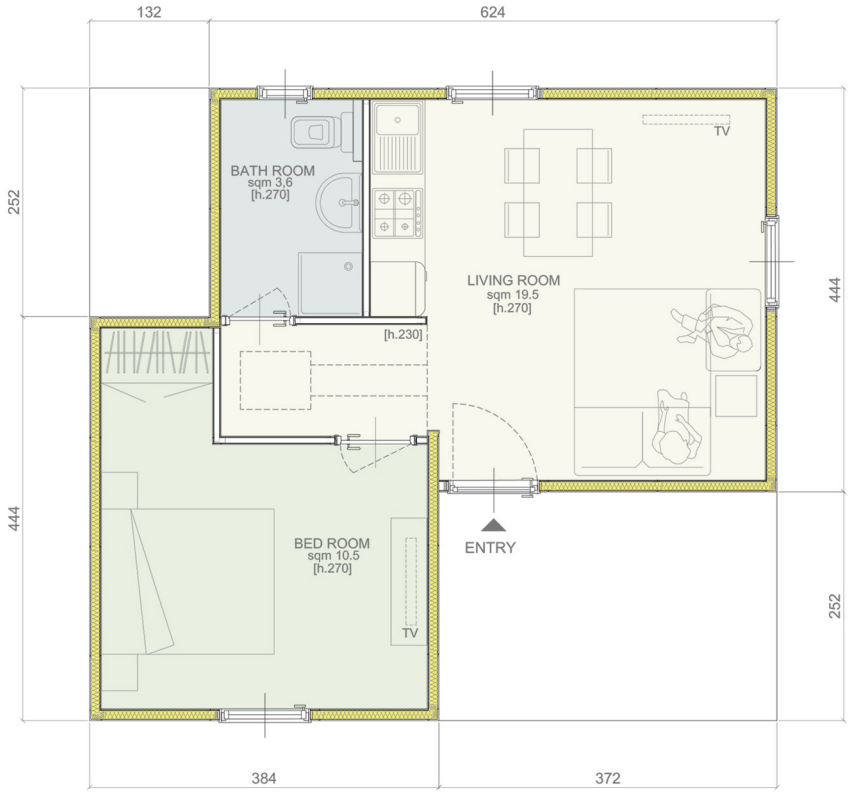
The electric system is completely built in walls (with around 12 electric plugs and light sources) and the bathroom is designed to fit a shower (70x70cm), a sink and a WC.

The floor is laminated while the bathroom and kitchen panels are resin coated. Windows are of Naco type with orientable glass louvres. The internal doors are made of honeycomb wood while the external doors and windows are made of aluminium with security glasses.

The construction schedule is very fast: the assembling is estimated in three working days by a team of three people and the dismantling in only two days


616
856
BED ROOM
sqm 9,3
BED ROOM
sqm 9,5
BATH ROOM
sqm 3,6
KITCHEN
sqm 4,6
LIVING ROOM
sqm 21,5
DINING
ENTRY

TH temporary house



TH has been conceived during a competitive tender for the design of a temporary house (to host tourists) to be used during Expo 2015 in Milan. The layout is mainly created by overlapping two squares (40 m^2 internal surface) one for the day zone and the other for the night zone, providing a greater space to the living room with kitchen.

The internal height is 270 cm and it is covered with a flat roof in galvanized metal sheet hidden by a perimeter finishing.

The electric system is completely built in walls (with around 20 electric plugs and light sources) and the bathroom is designed for a shower (70x70cm), a sink and a WC with water jet.

The floor is laminated while the bathroom and kitchen panels are resin coated. The house is provided with thermal-break windows in aluminium, the internal doors are made of honeycomb wood while the main entrance has a security door.

In the tender, one of the requirements for the house was that it has to be very easily dismantled, that's why for this particular solution, the floor on the ground is conceived as an assemblage of self-bearing insulated panels mounted on screw foundations (of Krinner type). This system, a part from keeping the floor on the ground particularly aerated, gives the possibility to remove the house once the event is over.

The construction schedule is very fast: the assembling is estimated in three working days by a team of three people and the dismantling in only two days.

School building

School Building is a two storey building, designed for a German No-Profit Organization to realize a campus school in Ghana for an average number of 200 students at 1st grade. The building is divided in 4 classrooms and other accessory rooms (bathrooms, infirmary and so on).

The building is totally made with FPH system, including external and internal walls and floors (whose load is 400 kg/mq), excluding the external porch - built in timber pillars - and the floor on the ground, that is in laid concrete.

The internal height is 270 cm covered with a dual pitched roof in galvanized metal sheet, fully aerated with especially conceived timber tympanums in brise soleil style. The floor is laminated excepting the bathroom floor and kitchen panels that are resin coated. Windows are of Naco type with orientable glass louvres. The internal doors are made of honeycomb wood, while the external doors and windows are made of aluminium with security glasses.

The construction schedule is very fast, estimated in 15 days.

The FPH system offers a wide range of building possibilities, but usually it is assembled on a concrete slab with o without crawlspace. In case of temporary building, as for example in the TH type, the assembling can be done over a floor made of FPH panels hung over Krinner screws or other kind of piers, even masonry piers.

Graphic design

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