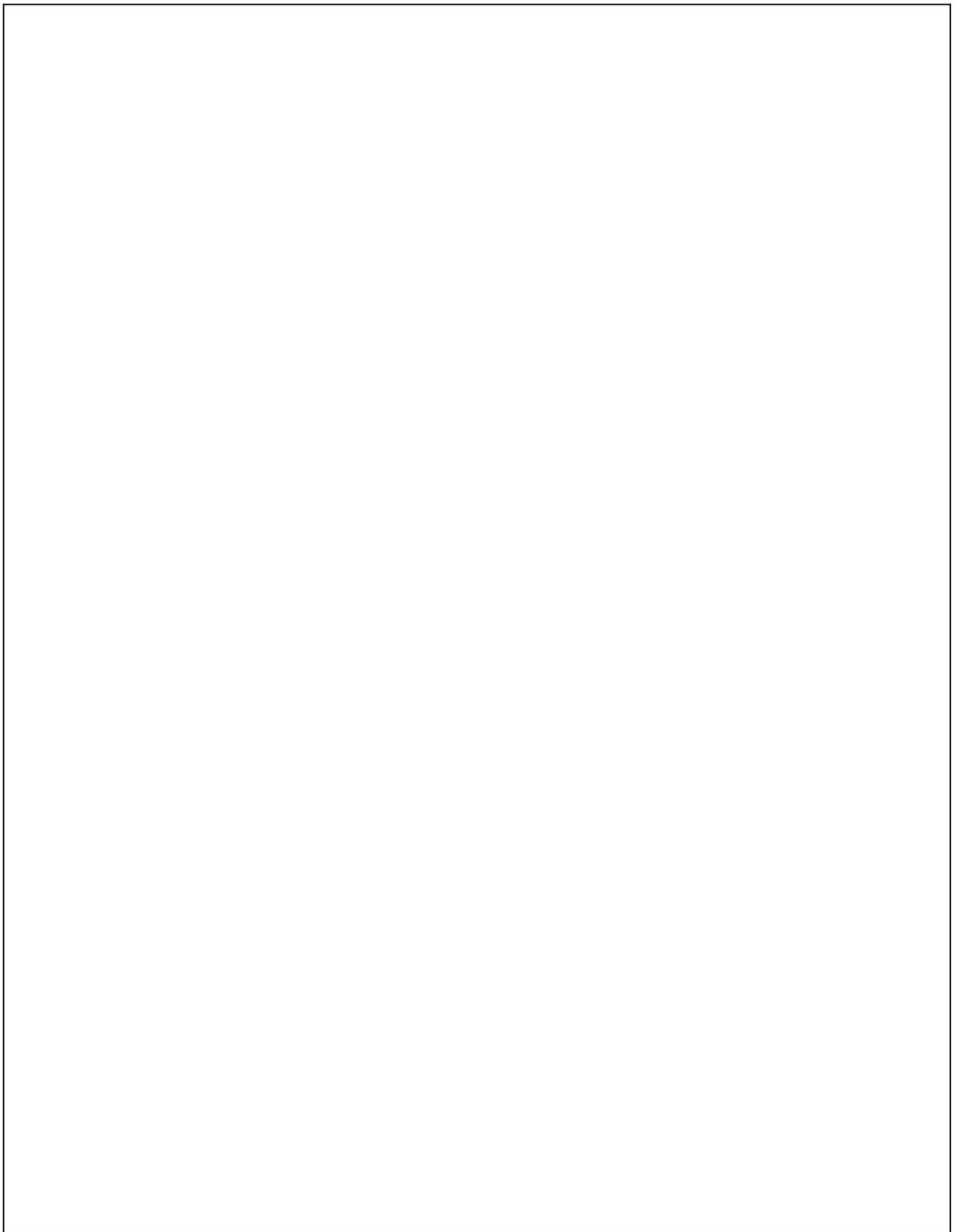




Introductory Brochure

Fall 2016





PROVIDING SOLUTIONS TO THE GLOBAL
BUILDING CRISIS THROUGH SUPERIOR
CONSTRUCTION SYSTEMS



High-end Homes, Multi-family Apartments,
Commercial Buildings, Educational,
Healthcare, Security Fencing, Hotels, Resort
Complexes, Golf Courses, Solar fields, Water or
Sewer Treatment Plants, Utilities, Roads, &
Infrastructure



Overview of Horton Construction Solutions

Horton Construction Solutions Africa (HCSAFRICA) provides a wide array of residential and commercial building systems geared at solving the Global Housing Crisis. **HCSAFRICA** does this while providing a superior structure that is stronger than traditional construction that is Hurricane, flood, pest and seismic resistant while having an estimated 1/10th of the carbon footprint of a traditionally built structure. Within this brochure we will only outline the structural composite panel portion of our company. *HCS's* housing product can be used throughout the world and in any environment.

HCSAFRICA produces a *panel construction system* that offers strength and durability with ease of construction providing a **highly energy efficient and durable structure unlike any other building system**. **HCSAFRICA** panels achieve this through the use of composites and an unlimited variety of designs. Included are sample plans which can be easily adjusted to your needs, or we can create project specific units that are adapted to your specific socioeconomic and regional need. Final pricing, plans and details will be provided specifically upon request, but we tend to be slightly less than traditional construction while bringing superior energy efficiency, durability, strength and are constructed in 1/3 the time of traditional housing. All the while leaving a carbon footprint of approximately 1/10 the traditional buildings and maintaining the energy within the materials.

Though the panel system of **HCSAFRICA** is newly formed, the idea has come from over fifteen years of research and development, and follows the CIPS methodology of construction. The experience of the team and the quality of the product will offer a level of confidence in the company's ability to perform as required by such immediate need and constraints. Company founders include Terry Horton, the co-founder of the largest home builder in the U.S. for the past 12 years, completing over 60,000 homes and \$19B in revenue in 2007. David Oberle, real-estate developer and former contractor with projects ranging from high-end resorts to airports. Steve Markham extensive commercial, retail and housing developments, Bernie Carballo international factory development and vast international contracts and sales, Herbert Molina, expert in Caribbean and Latin American Sales, John Pardue who have been involved in the development of a panel system building (CiiPS) for composite panel structures for the past 10 years in more than 10 countries.

HCSAFRICA designs various housing, municipal and commercial units to coincide with projects specific needs to adapt with the regions socioeconomic needs and expectations. Whether single occupancy, duplex, dorms or multiplex living quarters; temporary, mobile, or permanent houses requirements, **HCSAFRICA** can meet the high yield construction demands.

HCSAFRICA is open to various financial and contractual structures to allow for the development of projects. Contractual structures could range from a simple construction contract for a facility to a joint venture where both parties equally share both the risk and reward.

HCSAFRICA can reach large numbers of units that are move-in-ready within weeks of finalizing contracts. We are willing and able to ramp up quickly to meet any need from 10 to 100,000 single family units, as fast as any housing production company with a longer lasting more energy efficient and cost effective unit almost anywhere in the world. And can produce 100's of thousands of square feet in multifamily, commercial, healthcare educational facilities as well as miles of security fencing.

On projects of substantial size (approximately 500,000 of buildings), **HCSAFRICA** may choose to build a factory in the area in order to meet the need and lower costs which increase the areas economics through job creation and spending. **HCSAFRICA** panel systems are initially complex to engineer but easily constructed and a labor force can be created in most any region.

All Composite Structure demoed within this brochure were built with scaffolding and no heavy equipment.



ELEMENTARY SCHOOL IN HAITI



Horton Structural Integrated Panel System - HSIPS

The **HCSAFRICA** panel system is comprised of a structural composite sandwich laminate, which integrates Phenolic-fiberglass Reinforced Composite sheathing skins and framing in one monolithic structure. The structural skins, which also form the finished exterior and interior wall panels, are made from high-strength E-Glass fiber fabrics, impregnated with a fire-resistant phenolic epoxy resin. The strength of the skins is approximately TWICE the tensile strength of mild steel, yet it has thermal insulation value many times that of steel. It takes an order of magnitude higher impact energy to damage the exterior skin as it does to dent a structurally-comparable steel sheathing skin. The sandwich core is a closed-cell expanded polystyrene system or polyurethane rigid foam, which simultaneously carries the shear loading of the wall panels and also provides an R-14 - R36 + value of thermal insulation – one of the best in the building industry.

The **HCSAFRICA** Integrated Panel system or sandwich concept is analogous to a continuous row of vertical steel I-beams welded flange-to-flange, in that the composite skins take on the role of the steel flanges front and back, and the polyurethane foam fulfills the similar role of the web plates of the analogous steel I-beams. Of course, the polyurethane foam is continuous, as opposed to the discretely-spaced steel web plates. Unlike the steel web plates, the continuous foam cannot buckle, since it is a continuous medium.

Since the density of the Composite skins is about 1.9, and the foam is about 0.035, the resulting **HCS** panel is extremely light, as compared to conventional masonry, steel, or wood building structures. Design “dead loads” for **HCS** structures are almost negligible.

HCSAFRICA panels are void-free and impermeable to water, air leakage, and vermin. They obviously cannot rot or deteriorate in normal atmospheric or solar exposure, and they are ideally suited for constantly-wet conditions. Mold and mildew cannot form in the panel interior, unlike many competitor building systems. In fact, boats and houseboats have been made of identical materials as the **HCSAFRICA** system, and can be expected to last indefinitely, certainly in excess of 50 years in this exposure.

Exposure to weather is extremely good, since water or moisture cannot penetrate into the interior of the panel system, further, the finished surface of the **HCSAFRICA** panels are integral with the structure itself. **HCS** panels can be painted, or aesthetic or decorative surface treatments can be applied to the inside or outside of the panels if desired, but they are not necessary, and certainly not for purposes of environmental protection of the structure. This is already provided by the basic constituency of the panels themselves.

The strength of the HORTON panel skins is approximately TWICE the tensile strength of mild steel, yet it has thermal insulation value many times that of steel.

The HORTON panels systems may be designed to match any use in any condition. The HORTON panels have been fire tested and they meet standards of countries and states where they have been used, including the particularly stringent requirements of Miami-Dade County of South Florida in the United States. The panel systems have successful certification under the world's toughest hurricane resistance laboratory testing requirements set by the Miami- Dade (South Florida) Building Code Authority as well.

Lighter than wood, structures can be built in one fifth the time, while also eliminating the need for cranes and other heavy machinery which cuts down on fuel requirements and makes for a quiet, unobtrusive construction process.



The composite skins will not support combustion, and they form a protective intumescent char which insulates the structure from further heat exposure to fire. The products of combustion, due to fuel-fed fires held against the building surface, are not poisonous to humans, unlike other competing FRP structural systems which have to rely on brominated resins to form their structure. Those brominated resin systems, while fire-resistant to a degree, emit heavy volumes of highly-toxic smoke containing HCl and hydrogen bromide when pyrolyzed. **HCSAFRICA** building panels do not have that problem, as the fire-resistance is built in primarily by the basic fire resistance of the base resin, and the additives used to enhance that already good fire resistance only emit water (steam) when pyrolyzed.

Many masonry building systems simply collapse when exposed to fire temperatures above their calcining point, wood structures obviously burn, and steel structures collapse when the overhead floor framing reaches the softening point at moderate fire temperatures. **HCS** structures will be standing long after the collapse of competing building systems under identical fire conditions.

One really interesting advantage of the **HCSAFRICA** composite panels is that the high thermal insulation property of the panels prevents fires from being transmitted between adjacent rooms through conduction, or from the exterior of the building to the interior. That is a particularly difficult problem for metal buildings, and fire insulation must be added to the metal structure to prevent that phenomenon.

Due to the light weight of the **HCSAFRICA** panel system and the high damping coefficient of the composite panel structure, the seismic resistance of the structure is extremely high, as compared to other types of building structures. The inertia of the structure is very low, the fundamental frequencies of the building are very high, and of course the strength is very high, making for an earthquake-proof building system.

Hurricane resistance of the **HCSAFRICA** structure is extremely high, as demonstrated by their successful certification under the world's toughest hurricane resistance laboratory testing requirements set by the Miami-Dade (South Florida) Building Code Authority. There are no loosely-fastened building components that can be torn off by wind, and the structure itself is very strong. Joints in **HCSAFRICA** buildings are continuous and made from the same high-strength materials that the basic panels themselves are built from.

Also required for hurricane resistance testing is missile impact resistance. Trees, other flying building panels, roofing tiles and the like are a persistent threat posed by hurricane exposure. Impact resistance of the **HCSAFRICA** panels has been tested and certified by laboratory tests required by the stringent Miami-Dade (South Florida) testing program required by the state for such missile impacts.

All things considered, the **HCSAFRICA** building panel system is a major technological leap forward in the advancement of building systems for homes, factories, warehouses and office buildings.





Elements of a HSIPS Wall Panel

The Citadel Composite Laminate Layer (Citadel is co-founded & majority owned by Terry Horton and David Oberle) is the strength and structure of the panel. Composite materials are engineered by sandwiching matrix materials around reinforcement materials. Matrix materials often consist of polymers or resins such as polyester, polypropylene, and epoxy as well as cement, metals and ceramics. Reinforcement materials may include fibers made of glass, carbon, cellulose given the use of the panel. The materials are generally fabricated in a mold by saturating the reinforcement materials with the matrix. Through heat or chemical reaction, the materials band together into a stiff, rigid structure. The fabrication of HSIPS's composite materials involves powerful, high quality processes incorporating world-class, ISO-based manufacturing standards.

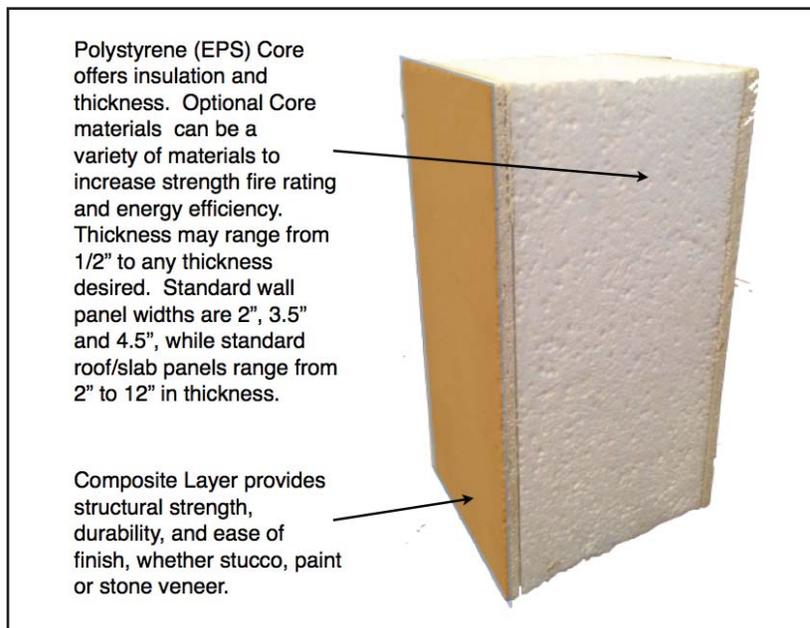
The Core, generally an EPS or XPS material, is the building block of HSIPS. By using the EPS materials as the core, the panels are incredibly energy efficient and can offer as much as an R24 in a standard 4" panel. EPS allows electrical and plumbing chases that are easily milled within the panels within the factory or on-site dependent on the clients application.

Possible Core Materials

Expanded Polystyrene (EPS)
Honey Comb

Extruded Polystyrene (XPS)
Natural Materials (Hemp)

Polyurethane (PU)





The Various Uses of a HSIPS Construction Panel

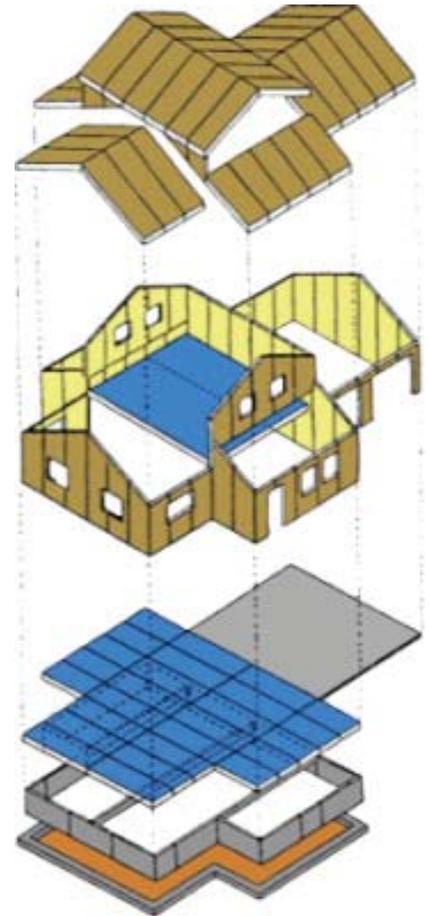
Roof Panels can be used in association with other construction systems. (Log & Timber Construction, Concrete, Bricks, Steel or Panel walls).

Wall Panels can be used as structural walls, fill-in walls or insulated exterior siding. Walls can be shipped pre-wired or pre-plumbed. Please note that Wall panels can be adjusted throughout the structure to best suit the needs of the user and may also be used for privacy landscape/courtyard walls.

Floor Panels can be used instead of concrete and wood floors, allowing for openings in floor to access living and storage spaces making access to mechanical, electrical, and plumbing systems easier.

Crawl Spaces and Basements can be created from panels creating additional living and storage spaces.

Reduce the cost of concrete by using only piers and/or beams and footings as required. Ideal for remote, sandy or hard rock earth locations.



HSIPS is Mobile

The versatility HSIPS offers is unparalleled considering the benefits of using the product which is completely modular and mobile. HSIPS can be designed for temporary housing in disasters and offers a flexibility to place on leased land.

Due to its incredible strength and light weight, a home built with HSIPS may be moved by crane or helicopter with little additional preparation other than installing hoisting eyes.



Reasons to Use **HCSAFRICA** Panels

Unmatched in Structural Advantages for Housing Solutions:

- ◆ State of the Art technology, mixing tried and true tested Fiber Composite Materials used in shipping, aviation and automotive competition industry with SIPS construction methods.
- ◆ Superior structural quality systems designed for the specific needs of the client. Panels have been approved use in the USA, Africa, Germany, Venezuela, The Caribbean, United Arab Emirates, Angola, Haiti and among other countries.
- ◆ Extraordinary structural durability.
- ◆ Deflects airborne debris from major winds and storms
- ◆ Waterproof, can be power-washed both inside and outside the structure without damaging the panel's integrity
- ◆ Non-flammable structure, can be designed to withstand any fire rating tests.
- ◆ Resistant to mold, rot, termites vermin and osmosis
- ◆ Built with non-corrosive materials
- ◆ Monolithic structure will endure all climates
- ◆ Excellent insulation that significantly lowers cooling/heating bills and noise transfer
- ◆ Can be equipped with **HCSAFRICA** Self-Sustainable Solar Energy Package*(optional)
- ◆ Built-in **HCSAFRICA** furniture options available
- ◆ Ability to build houses of 50 m², 100 m² and 200 m² in 1, 5, and 10 days.
- ◆ Traditional construction materials not needed (cement, steel, wood, bricks), while it is still 100% compatible when you want to use them as coating or aesthetic materials. (Flooring, Columns, etc..)
- ◆ **HCSAFRICA** panels have been lab tested and proven to be resistant to Earthquakes, Fire, Tropical Storms, Hurricanes up to Cat 5 and Floods.
- ◆ Unbeatable performance in wet environments, salty environments and environments with extreme and sudden temperature changes. Because of the **HCSAFRICA** panel composition it leaves no seams for leaks or provides no fuel for the elements to begin decomposition of the structure.
- ◆ No Machinery or Heavy Equipment is needed to construct. Varying Skilled Workforce is not required.
- ◆ Green Construction System. No waste or Toxic emissions generated.
- ◆ UP to 10x less in Carbon Footprint as reported by MIT than traditional construction methods.
- ◆ Excellent thermal behavior that allows major energy savings.
- ◆ Through structural testing, traditional **HCSAFRICA** panels allow for a variety of loads



Factory Set-up

Factory Overview

HCSAFRICA proposes in areas that require a number of units annually to set up a factory. These factories are intended to be regional and can be scaled to suit the unique need of the Country or region. The factory, though specialized, is easily assembled and can be housed in most converted warehouse buildings, or can be constructed from our panel kit to suit the exact needs with easy expansion capability.



Factory Operations

HCSCALA system is designed to allow unskilled labor to be trained in a only a few days to effectively produce our panels. The Horton Construction Solutions method is a simple process which uses a simple concept of manufacturing to produce a high out-put at a relative low cost. Dependent on the factory arrangement, most factories can be up and producing panels within 30 days of equipment arrival in an existing building.





HCSAfrica's Simple Production Container Factory

Production Capabilities:

- 300 homes per year
- 1 home per day
- 2,500 s.f of homes per day



Attributes of Factory:

Full production of panels within a few days of arrival to location (with existing warehouse space.)

All machinery and parts fit in a single standard shipping container.

All machinery and equipment is mobile and can be quickly relocated to another project or region.

Ease of mobility creates local jobs

Small factories creates simple local franchising opportunities (factories may remain to provide additional homes for other projects within the area)