

GEE Team 88 presents

Pall-ETS

Emergency Transition Shelters



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Executive Summary

The following business report will explore our product design that is 'Pall-ETS' – Pall- Emergency Transition Shelters - and proposed business plan venture. The creation of Pall-ETS is to meet the rising demand for shelter for those in need –due to disasters that strike communities or displaced refugees. The primary need is to provide durable and sustainable shelter for those in desperation with the primary concern being for children both surviving the crisis itself and mitigating trauma experienced. This is due to the versatility in design, Pall-ETS can also be constructed into reliable shelters that can be used as schooling facilities.

Pall-ETS are re-designed modified versions of original standard pallets that are used as a means of assisting shipped goods. These pallets are designed to minimize the labour of their construction and maximise their sustainability. It will be the existing humanitarian aid and disaster relief organisations such as The UN Refugee Agency, UNICEF, Relief International that we will target to sell our Pall-ETS to.

They will be manufactured in Mexico then professionally distributed by these organisations to those in need of immediate relief shelter. We will be profitable by 2017, selling 1000 Pall-ETS kit sets, cost price of \$1769.39 and selling price of \$2000, resulting in a profit of \$87,610.00, with demand forecast to increase into the future.

Introduction

The following business report will explore our product design that is 'Pall-ETS' and proposed business plan venture. The creation of Pall-ETS is to meet the rising demand for shelter for those in need. Unexpected disasters that strike communities or displaced refugees are some examples of people who will benefit from Pall-ETS. The primary need is to provide durable and sustainable shelter for those in desperation with the primary concern being for children. In addition to Pall-ETS providing shelter for families and children, they are versatile in design and can also be constructed into reliable shelters that can be used as schooling facilities.

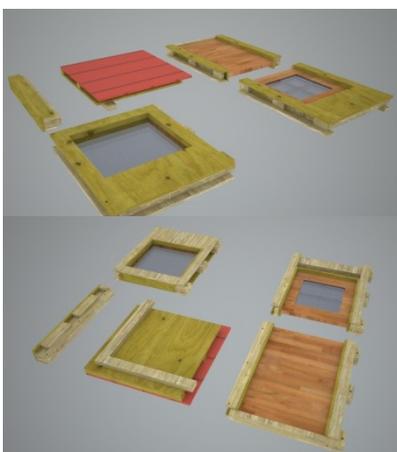
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Pall-ETS product overview:

The 'Pall-ETS' modules have been carefully designed and developed to offer a simple and fast solution to humanitarian aid shelter. The modules have a 'male' and 'female' side which then slide together respectively. The design ensures that there is solid timber support adjacent to all bolt holes which can be tightened sufficiently to produce a strong, safe and structurally sound construction. The ease of assembly ultimately means no skilled workforce is required to erect the shelter, they are extremely fast to assemble and make secure.

The main wall panel module has been designed to comply with the 'ISO' standardisation for shipping pallets (ISO Standard 6780 (2003) - Flat pallets for intercontinental materials handling - Principal dimensions and tolerances). The modules measure 1016mm x 1219mm. The justification is that these are the most efficiently sized pallets for ISO 40ft containers. 20 pallets will fit on the floor of a 40ft ISO container, leaving only 3.7% wasted space. These main wall components are multifunctional and can also be used as traditional shipping pallets. This offers a highly unique sustainable and efficient solution to utilise space which would most often be wasted as we provide a multi-use solution.

There are 5 further components which are as follows: corner post, window module, door module (made in two parts) and roof module. In keeping with the main wall panel modules they are all standardised



dimensions meaning they can be efficiently packaged within ISO shipping containers and securely packaged on the main wall panel modules without the risk of damage in transit. Only the wall panel modules are designed to be used as traditional shipping pallets. The window and door modules come ready assembled, weather proofed with flashings and fitted with ironmongery to aid the speed of assembly. They slide together using the same 'male' and 'female' system as found in the main wall panel module components. The roof utilises corrugated aluminium roof sheets bonded to rigid foam insulation with lightweight joists strengthened with cross brackets.

Appendix 1 demonstrates the versatility of the modules and shows



a typical installation that could be deployed highlighting components required. The unique design of the modules mean they are extremely versatile. Smaller structures can easily be formed by using less modules and larger buildings are possible to an extent with future development work considering the structural elements of the roof. The main wall pallets can be lifted from two sides. They are constructed from recycled joists and stringers and a 'Marine' plywood top which forms the external side of the building. By recycling old pallets for the stringers and joists we keep the cost down and the 'Marine' plywood is water proof meaning that it will cope in both wet and humid climates as well as dry climates. The pallets will be glued and screwed ensuring the maximum strength is achieved.

The structure provides a wind and watertight solution which is far superior to present options offered in the market such as tents. The structure is designed to be semi-permanent. It can be shipped to the customer along with insulation material such as rockwool insulation or a more sustainable option is for the local communities who benefit from the shelters can insulate with local materials such as cob, straw, sheep wool and other sustainable local insulating materials.

Benefits of the system:

The system has been carefully developed considering the issues faced by youth and children in the developing world. In particular the hardships found in Nigeria, Indonesia, Iran and India. The lack of shelter and quality education during crisis events is a serious concern. For example in Nigeria our primary research has shown that there is several local communities such as Akaran where there are hundreds of children and youth sleeping and living under a bridge because they have no shelter available. Thus the benefits this system would bring forth are a home for the homeless and help for the helpless. Interviews were conducted with several disadvantaged youths living in these situations in which they expressed their full support and desire for the system to be implemented. They stated that it would end their suffering and give them the chance they need in life.

In warzones and natural crises, it has been found that the most important ways to prevent long term trauma for children is to get them into the routine of schooling and sport as soon as possible. Counselling has a much lower success rate. However school buildings are often devastated or used as a public refugee and crises centres, preventing children from returning to schooling. Our disaster shelters can either be used directly as classrooms, or shelter for refugees – either way they enable school children to quickly get back into schooling and improve their capacity to cope with the trauma.

The system has been designed with sustainability and simplicity at the forefront. By recycling old discarded shipping pallets we are able to benefit from reduced costs and limit the carbon impact of the business. By standardising the module components size to ISO standards and ensuring efficiency is kept at the forefront of the system we are able to benefit from reduced shipping costs and space savings in shipping containers by utilising traditional pallet space as our new multi-functional use. The system is designed to be extremely fast and easy to erect which is of great importance in the event of an emergency crisis. The designer has consulted with Joseph Boniface Architects Ltd (2014) a Royal Institute of British Architects Chartered Architecture firm to discuss the feasibility of the design in which excellent feedback was received and full support of the system application and feasibility granted.

Shelters utilising pallets do exist such as the i-Beam design which has won several prestigious awards. Yet there are no companies that have reengineered pallets for this purpose. We believe the business is highly innovative and unique and patents will be submitted to protect our design and system from competition. The system is far superior to competition due to its ease of construction, other pallet systems require tools, and lengthy construction adaption to be able to build a suitable shelter. They also cannot be easily disassembled and reused. Whereas our system only requires one

set of tools (spanners) it can be reused and disassembled easily without causing damage to the modules. It can easily be extended if the need is there through the addition of extra wall and roof panel modules. It saves time and energy in crisis events. It is also superior to other crisis shelters such as tents as it is a more long term semi-permanent solution which is sustainable. The quality of the build and the system is kept extremely high during manufacture and may surpass local traditional shelter construction in certain locations. It is designed to be highly resilient to all weather types and can be used for many years which is crucial for crisis zones as it takes substantial time to rebuild the community and shelter in these events.

Marketing

Primary target market

Our primary target markets are the not-for-profit humanitarian aid organisations. These organisations provide assistance to those in need of urgent response as a result of unexpected or on-going crises. Our Pall-ETS will directly target the developmental aid aspect of these organisations. That is, they will seek to provide strong, long-lasting shelter for families and young children in which their current living arrangement is unsalvageable or unliveable. These shelters will go beyond just family homes, they can be constructed and self-deigned into a place for children to learn and act as a school. The unique design of Pall-ETS will give children the opportunity to learn in an environment that is safe, durable, and sustainable, and where all their classmates can be at once. Organisations such as UNHCR -The UN Refugee Agency, UNICEF, Relief International and World Vision, are just some of the aid organisations that already specialise in providing shelter and whom we will provide our Pall-ETS to.

Competitors

Our competitors will be the existing suppliers of the aid organisations listed above that sell shelter products. The closest product out there to Pall-ETS and which we will be competition against is the I-beam pallet houses. These are 'blue print' standard and unmodified pallets that are sold to aid organisations through I-beam, where they are constructed into a shelter that's basically "semi-permanent" and overly complicated as a result (I-BEAM Architecture and Design, 2013). The most common existing form of shelter at the moment are the tent like shelters. You only need to look at these for a second to immediately see all their flaws. Our Pall-ETS obviously require a lot more work than making a tent out of material, however in saying this, the little labour work that is required to construct a Pall-ETS shelter will prevent less maintenance work in the future and provide a greater, more stable shelter for the long-term.

Competitive advantage

The redesigned pallets we have constructed that is 'Pall-ETS', are an improved modification of the existing pallets out there today. The life span of Pall-ETS when turned into a shelter has significantly increased and overtook the existing 'blue prints pallets' that I-beam currently supply considerably. "Semi-permanent" is the term I-beam uses to explain their blue prints; this is because the pallets they are providing are simply standardised untouched pallets from container ships essentially.

With the adjustments and modifications we have made that is Pall-ETS - there is nothing semi-permanent about them. They have been designed to be highly resilient to all weather types which will increase their life expectancy considerably. Unlike I-beams 'blueprints', we have created convenience to pallet housing by reconstructing the pallets themselves to minimise the need for materials to construct the shelter. Moreover, this eliminates any training costs that would be required to construct these houses. Bolts and a spanner are all one needs to build their own Pall-ETS house (which are both included in the kit). This generates a simplistic approach that anyone can follow, maximising convenience and minimising the time it takes to construct (both very important

factors in crises and communities where children are often the best helpers). By simply adjusting and modifying the pallets themselves we have added greater value to the raw product.

Potential customers

The main customers from our targeted market are the aid organisations that not only respond to urgent crises caused by disaster, but provide on-going services to those in need as a result of poverty or unexpected living arrangements, such as refugees. The top two organisations from the list above; UNHCR and Relief international, specialise in providing shelter in these circumstances (UNHCR - The UN Refugee Agency, 2001-2014).

A lot of communities in poverty struck areas currently use soft materials as the basis for shelter; this is extremely problematic and not sustainable over time. Pall-ETS can change this type of living arrangement into something a lot more sustainable. If these specific organisations are not already being supplied with pallets from I-beam for example, the answer for shelter will be our Pall-ETS. If they are already being supplied with blueprints from I-beam, the argument for our Pall-ETS being of greater convenience, less time consuming and sustainable will speak for themselves. These organisations will have no choice but to be impressed and won over, as they are the latest, modified pallet made available to provide shelter. After all, they are about providing the best, most sustainable, low cost, low maintenance shelter for their people and because of that, Pall-ETS is the only answer.

An example of a real life scenario where Pall-ETS would save and get lives back on track is the disaster that has struck the Solomon Islands. The flooding that has occurred has affected more than 50,000 people, some of their homes and everyone's community buildings. Our Pall-ETS can provide immediate aid for these people and children affected, providing them with safe durable shelter away from the disaster.

The strategy we will use to convince these aid organisations to buy our Pall-ETS will be a pilot programme. This will involve demonstrations of our Pall-ETS and the construction of turning them into a shelter. These will then provide models which we will sell at a discounted price to the organisations so they can test and trial them themselves before they begin buying our Pall-ETS in bulk.

Finances

Finances have been calculated in US dollars as it is a staple international currency, easily converted and accepted globally.

We will operate on an initial start-up loan from Banco De Mexico, one of the biggest banks in Mexico. The loan will be to the value of \$800,000 USD with the addition that should business be operating smoothly after a year, an additional \$200,000 loan will be extended in order to expand manufacturing capabilities. We will set up manufacturing facilities in Mexico, operating as a Maquiladora. A Maquiladora is a factory or assembly plant operated in Mexico under preferential tariff programmes. These allow materials to be used in maquiladoras to enter duty-free, provided the finished product is then immediately exported out of Mexico, decreasing the costs of our distribution network. Maquiladoras can now be established anywhere in the country (StartUpOverseas)

In Mexico, the minimum wage is US\$5.13 per day, however we will encourage a high standard of work and set an ethical living standard by paying US\$2 per hour, equalling US\$16 per day for an 8 hour shift. We will employ 20 employees in our initial year, who will be able to assemble 16 complete kit sets per week, assuming it will take 1 man hour per module to modify. As Pall-ETS are

proven as the best product for our customers, demand will increase. To accommodate for this, we will increase manufacturing capabilities by employing more people and extending our manufacturing facilities. We predict the cost of production per kit will decrease due to economies of scale, it will take less man hours per Pall-ETS kit and we will be able to better take advantage of bulk buyer discounts and further decrease the cost of materials.

The decision to base our operations in Mexico is due to its central location to many global shipping lanes, giving ready access to an ongoing supply of pallets. The cheap labour reduces the cost of production, and the proximity to the USA allows quick shipping to the many aid agencies based in the USA.

	2014	2015	2016	2017	2018
Forecasted sales					
Units	50	250	500	1000	2000
Selling Price	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00
					\$4,000,000.00
	\$100,000.00	\$500,000.00	\$1,000,000.00	\$2,000,000.00	0
Less Expenses					
Cost of Sales					
Materials	\$80,969.50	\$404,847.50	\$809,695.00	\$1,619,390.00	\$6,477,560.00
Labour	\$7,500.00	\$37,500.00	\$75,000.00	\$150,000.00	\$300,000.00
Running expenses	\$50,000.00	\$65,000.00	\$70,000.00	\$75,000.00	\$80,000.00
Distribution	\$1,000.00	\$5,000.00	\$10,000.00	\$20,000.00	\$80,000.00
Total Cost of Sales	\$150,719.50	\$567,347.50	\$1,069,695.00	\$2,064,390.00	\$8,017,560.00
Finance expenses					
Loan principle	\$800,000.00	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00
Interest on loan @ 4.8%	\$38,400.00	\$48,000.00	\$48,000.00	\$48,000.00	\$48,000.00
Total Expenses	\$189,119.50	\$615,347.50	\$1,117,695.00	\$2,112,390.00	\$8,065,560.00
Net profit/loss	-\$77,869.50	-\$60,347.50	-\$12,695.00	\$87,610.00	\$293,220.00

Production costs for Year 1 of operation			
Cost of 1 Kit	Quantity	Price per unit (USD)	total
Wall Panel Modules	33	\$27.33	\$901.89
Window Panel Modules	5	\$25.50	\$127.50
Lower Door Panel Module	1	\$27.00	\$27.00
Upper Door Panel Module	1	\$27.00	\$27.00
Corner Post Module	8	\$10.00	\$80.00
Roof Panel Modules	24	\$15.00	\$360.00
Cross Strengthening Brackets	15	\$5.00	\$75.00
Bolts	220	\$0.05	\$11.00
Spanner Set	1	\$10.00	\$10.00
Total cost of materials			\$1,619.39
Labour of creating Kit (man hours)	75	\$2.00	\$150.00
Cost of kit			\$1,769.39
No. of kits created and packaged per week	16		\$28310.24

Prices sourced from (Ali Express)

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Appendix 1

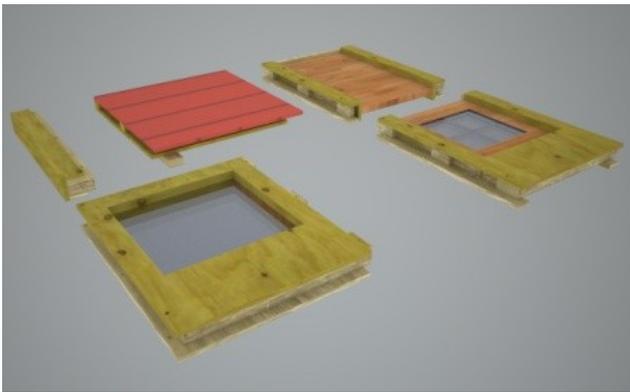
Here is an example structure that could be assembled. It measures roughly 6x4 m and requires nothing more than a pair of spanners to assemble. Following are the components required to form this kit.



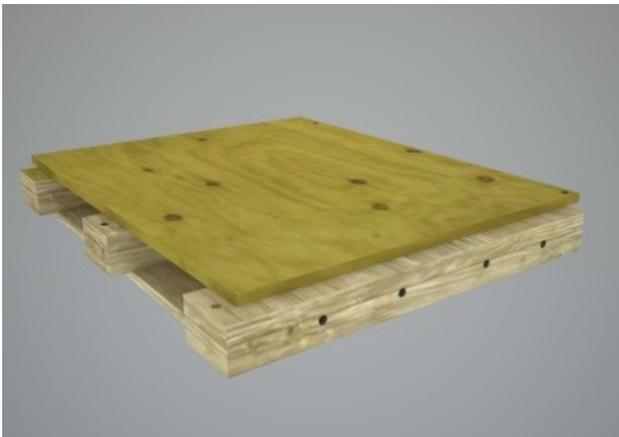
- 33 x Wall Panel Modules
- 5 x Window Panel Modules
- 1 x Lower Door Panel Module
- 1 x Upper Door Panel Module
- 8 x Corner Post Module
- 24 x Roof Panel Modules
- 15 x Cross Strengthening Brackets (for roof construction)
- 220 x Bolts
- 1 x Spanner Set



The four pallet modules from below



The four pallet modules from above



The main Wall module from above,
displaying the male/female interlocking
system



The main Wall module from below