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PALLET RACKING HOUSE

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ABSTRACT

Around millions people would need housing during emergencies or when natural calamities have occurred. Existing built environment cannot cater to this large transitional demand. Migrant youth and populations in urbanizing cities are also facing housing shortage.

Our objectives using absolutely no jargon and creating a model for low cost affordable transitional housing which is modular, high density and incremental. From the latest innovations in building technologies from the warehousing and logistics sector which has seen a huge demand due to flourishing ecommerce. Rack supported buildings and heavy duty pallet rack systems will be used for solutions for creating high density inhabitable spaces.

It will be successful as this methodology is already mainstreamed in warehousing and pallet racks are available all across the planet wherever there are warehouses. Pallet rack manufacturers have sprung up in industry in all major places and can be collaborated with for design, their R&D and technical team's expertise, Material and installation.

Keywords:- Pallet Rack, Steel, Snow Load, Resistant, Temporary Housing, Warehousing, Wind Load.

I. INTRODUCTION

Nepal's earthquake, tsunamis, Japan's earthquake, the mahakumbh, landslides, hurricanes, floods, snow falls, major events like tomorrow land in all these events there is a common problem in all these events that is it causes a major demand for temporary housing of millions of people tough they have come for an event or homeless they need some housing facility for a limited amount of time but it doesn't make but of at all to build a housing system for these events as it becomes uneconomical! And at present situations like this are all handled by tents which is very cheap but simultaneously it is very poor in rendering services like proper sanitation, proper place for cooking, and it is just More or less just a settlement on something that is better than nothing. And the housing systems with proper services are uneconomical as well as not easily constructible!

In all the below mentioned plots and conditions there is a situation in common that there is no proper scheme made which gives people a sustainable housing scheme, all the options are either expensive or not at all facilities are there, there are no amenities given for the purpose.

With studying the above mentioned problem we after having a thorough survey, we explored and studied the solutions in market and studying its pros and cons thus we are proposing a new technique called pallet racking

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So what is pallet racking house?

Pallet racking is a warehouse structural system which is designed to accommodate people in mass in minimum possible area in comfort and thus proves very economical option as by using this method 70-80 people can be accommodated in 1500 sq.ft area also the best part of it is that it takes only a day to set up the whole housing system enough for housing for 70-80 people and providing features like construction of unskilled labouy, Totally hygienic, Giving maximum Portability while provide Privacy like permanent structures, also Waterproof even seismic resistant to a certain level. And Striping Time is less.

Pallet Racking systems is best suitable for Padharpur Yatra, Tirupati, Kerala, Sunburn Goa, Druga Pooja Uttar Pradesh, Amaranth Yatra, Runn Utsav, Kedarnath, Kashi Varanasi and also in places like Nepal's Earthquake or Syrian Refugees can be most benefited from pallet racking structure as it can produce extensive housing in very much low amount of time and cost.

II. METHODOLOGY

2.1 Problem Statement

Tsunamis, Japan's earthquake, nepal's earthquake, hurricanes, floods, snow falls, the mahakumbh, landslides, major events like tomorrow land etc.

2.2 Solution Is Market

Tents and military tents, Cargo housing, Honeycomb village,

2.3 Our Solution

Pallet racking is a warehouse structural system which is designed to accommodate people in mass in minimum possible area with comfort.

2.4 Potential Markets And Customers

Pandharpur Yatra, Tirupati, Druga Puja, Amaranth Yatra, Ranutsav.

III. RESULT

Table 1. Show The Statistical Data Of Sunburn Fest.

STATICS					
Sunburn Festival	**2007**	**2008**	**2009**	**2010**	
Attendees	10,000	20,000	35,000	86,490	
Artists	36	45	66	92	
Local audience	1,500	3,500	5,000	10,200	
National audience	5,500	10,000	18,000	22,215	
International	3,000	6,500	12,000	22,075	
Fan Base	3,000	6,500	12,000	30,000	
Activities					
Stalls	10	30	65	90	
Flea Market	Yes	Yes	Yes	Yes	

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Fire Jugglers		Yes			
Volleyball court		Yes	Yes		
Massage centre		Yes			
Spa			Yes	No	
Rock climbing		Yes	Yes	Yes	
Mechanical bull			Yes		
Digital photo zones			Yes		
Moonwalker				Yes	
Makeover lounge				No	
Sunset lounge				Yes	
Slippery football			No	Yes	
Slippery volleyball				Yes	
The Shacks				Yes	
Experimental Stage					

Table 2. Comparison Of Solution In Market

Subjects	**Pallet Racking**	**Honeycomb Village**	**Tent**	**Container Housing**	**Permanent Housing**
Needs	For temporary living	For efficient living	For camping	For normal living	For permanent living
Versatility	Maximum	Maximum	Minimum	Average	Low
Materials	Steel	Bamboo	Ripstop nylon	Container	Concrete
	PVC Sheets	Steel	polyurethane	steel panel	Reinforcement
	Ply	Tensile Fibre	Silicone	EPS/PU panel	Bricks
	Space frame	Solar panel	Aluminium	Wood	Stirrups
	Contaminants	Spaceframe		Aliminium	Aggregates
	Bamboo			PVC capet	Add-Mixtures
Privacy	Less	Average	Less	More	Excellent
Dead Load	2500 Kg	150kg for 1 room	2.49kg for 1 tent	1450kg each	More than 5000kg
	i.e. 70-80 peoples	i.e 10 people	i.e 24.9kg for	for 15sq.m	
			10 people		
Application	Kumbhmela Events (i.e. Art of Living)	Kumbhmela	camping	Site Office	Permanent living
	Yatra	syran	outing		

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Feasibility	Less	Less		More		Average	Extreme
Durability	7 years	10 years		1 year		10 years	100 years
Tools	Plier,	None		Hammer		Crane	Labourers
	Wrench (20mm)					Vehicle	Machines
						levelling	All type of
						instruments	construction materials
Time	8 Hours	4 Hours		1 Hour		8 Hours	Several Months
Space FSI	2400 sq.ft.	95Sq.ft.		32.5sq.ft.		15sq.m	Depends
		per room		for 1 tent			
Subjects	**Pallet Racking**	**Honeycomb Village**		**Tent**		**Container Housing**	**Permanent Housing**
Quality	Medium	High		Low		Medium	High
Portability	Yes	Yes		Yes		Yes	No
Amenities	Plug Points	W.C+Bath		Head Cover		W.C+Bath	Respective of the
RRH	W.C+Bath	Plug Points				Plug Points	price
	AC	Beds				Beds	
	Beds	Fans				Fans	
	Fans, Lights	Lights				Lights	
Aesthetics	Very Good	Good		Good		Bad	Accordingly
Labour	Min. 5	Atleast 4		Atleast 2		Atleast 10	More than 30
Cost	850000/-			8000/-		300000/-	Depending

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Table 3:-Costing Of Project

S. NO	DESCRIPTION	UNIT	QUANTITY	RATE INR	AMOUNT INR
1	Vertical steel uprights [profile - blue: 4" x 8 mts (26.4 ft.) high]	Nos.	12	11000	132000
2	Horizontal beams [profile - orange: 125mm x 50mm x 14 ft, 4.2 mts long)	Nos.	48	3600	172800
3	Steel Plate Footers (18" x 18" x 0.5")/Pre cast concrete slab foundations	Nos.	24	400	4800
4	Row spacers (1.5 mts)	Nos.	81	400	7200
5	Steel Pipes (2 inch by 2-inch x 8.4 mts)	Nos.	60	350	10500
6	wooden Bars (2 inch by 2-inch x 10 ft)	Nos.	60	350	10500
7	plywood 1 layers .5"	sq. ft	1800	47	42300
8	Stairs	Nos.	3	6500	19500
9	hand rails/guard rails (2"x2"x14ft)	Nos.	24	350	5250
10	Gravel	sq. ft.	1200	6	7200
11	Vinyl Roof sheet for water proofing	sq. ft.	600	27	16200
12	vinyl blinds (for walls)/awnings	sq. ft.	20	2200	44000
13	misc. (including electrical)			25%	118062.5
14	Duct tapes	meters	10	500.00	5000
15	Land				
	TOTAL				**595312.5**
	Walls				
	Metal roofing sheets	sq ft	3960	30	118800
	Total Cost				**714112.5**
	Inflation-10%				71411.25
					785523.75

IV. CONCLUSION

Pallet Racking is a housing scheme for a million people. it is most efficient way of living. specialty of project is using single nut and bolt and non-technical person who has no knowledge of civil engineering can set up a house for himself on platform in just a matter of few hours .does this system is very helpful for all the places where too much housing is required in a short amount of time for a medium period of time just like the event Kumbh-Mela where a lot of housing is required in a short period of time but for a medium period of time display adaptor in the system there is a low waste of materials and also materials can be used again and again and also this whole system can be folded up and fixed in a container of 40 feet wide thus this system is very

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much portable as well as it is very rigid and can house people comfortably. Also (Headlines of all the Features) make it as a most sustainable living option.

Pallet Racking is designed as WORLD'S MOST EFFICIENT HOUSING SYSTEM for temporary housing which would be very cheap, and offer all the services like bathroom, kitchen, sleeping place, proper ventilation, proper disaster management, fireproof, wind load resistant, snow load resistant. This setup can be setup in a day even by a 16-year-old that doesn't have any technical knowledge, this technology is also very cheap and brilliant thus it is providing effect which is simple, brilliant and maximum! That is Pallet Racking.

REFERENCES

Journal Paper

[1] K.M. Bajoria and K.K. Sangle," Capacity Based Design of Cold Formed Storage Rack Structures Under Seismic Load For Rigid And Semi Rigid Connections", The 14the World Conference on Earthquake Engineering October 12-17, 2008, Beijing, China.

[2] F.D Markazi, R.G Beale, and Godley, M.H.R. (1997). "Experimental Analysis of SemiRigid Boltless Connectors." Thin-Walled Structures, 28:1, 57-87.

[3] Damien Koen," Structural Capacity of Light Gauge Steel Storage Rack Uprights", School of Civil Engineering, The University of Sydney, august2008.

[4] N. Baldassino And R. Zandonini,"Performance of Base-Plate Connections of Steel Storage Pallet Racks", University of Trento, Italy 2000

[5] Hancock, G.J. (1985). "Distortional Buckling of Steel Storage Rack Columns." Journal of Structural Engineering, ASCE 111:12, 2770-2783.

[6] [Gregory J. Hancock, Lip H. The, Murray J. Clarke," Analysis and design of double-sided high-rise steel pallet rack frames", Faculty of Engineering and Information Sciences, Journal of Structural Engineering,(2004). 130 (7), 1011-1021.

[7] Davies, M. and Jiang, C. (1998). "Design for Distorsional Buckling.", Journal of Constructional Steel Research 46:1-3, 174-175.

[8] James P. Plantes, Deepak Ahuja, Ryan T. Chancey," A Case Study on the Collapse of Industrial Storage Racks",university of texas state,2004

[9] Godley, M.H.R. (1991). Storage Racking, chapter 1, Design of Cold Formed Steel Members, Rhodes ed. Elsevier Applied Science, London, UK, 361-399.