Project 'Pallaissance'

(anti-depression furniture)

Executive Summary

Australia has a reputation for ingenuity - for making something useful out of almost nothing. During the Great Depression, a particular style of furniture appeared - some examples of which, may still be found today. It was known as *Depression Furniture*

Figure 1-1 An example of 'Depression' furniture. The epitome of Aussie ingenuity and re-cycling.

The essential requirements for the materials and construction of depression furniture were as follows:

- little or no cost;
- readily available materials;
- re-cycled materials or re-engineered (e.g. petrol cans and biscuit tins were used as drawers);
- no complex joinery nor fittings, that would require skilled craftsmen;
- be capable of being constructed by untrained people using basic hand tools; and
- built to be functional not pretty (as they stated at the Bauhaus, the most famous design centre in the world, '*form follows function*') the shape and appearance arose from the essential purpose of the piece - not the other way around.

Since then, this tradition has been reflected in many Aussie inventions such as the clothes hoist and the great Australian *Ute* - the multi-purpose utility vehicle, early versions of which were very much 'home-engineered'.

This project represents a modern interpretation of utility furniture and seeks to re-kindle the same spirit of making useful structures from low-cost, abandoned, re-cycled or second-hand materials.

However, in this case, our motives are entirely resurrective, i.e. anti-depressive - hence I have coined the phrase - '*anti-depression*' furniture. Humans have an inherent need to make or grow things - and to play, creatively (play music, play games, play with words, role-play, dance). If we are inhibited, we can be depressed. This could be a wonderful outlet for creativity and productivity.

The term, '*furniteur*' was coined for my thesis and it reflected the essence of this project - pieces made to be used and made for the love of making them. *Furniteur* is a combination of the words *furniture* and *amateur* - with the French meaning of 'amateur' as someone who makes something for the love of it - not the remuneration. It is very appropriate for this project as it reflects all of the ideals I was aiming for.

So, welcome to my world of *anti-depression furniteur.*

This design concept proposes to utilise universal freight pallets as the structural basis for a range of products that can readily made by the home handyperson, male or female, or retiree - with limited tools. While any pallets may be recycled and used in this way, the designer recommends the use of new pallets - as many pallets have been damaged, badly repaired or have splits, splinters, protruding nails and may have been painted.

The work of restoring pallets that have been abandoned may or may not be justified as new pallets are available from a local Brisbane supplier for $15.00 each for a lighter weight pallet (still hardwood) or $25 each for standard, heavy duty pallets.

This project uses both options - depending on the loads that the structure may have to bear. Both have the same footprint area of approximately 1.2 metres square.

Why Pallet Based?

Pallets are available for internal use from lighter timbers, however, for external use, Australian hardwood is recommended (despite the extra weight). The weight is overcome by deliberately maintaining the open ends so that the structures can be carried by four men with slide-though posts or, of course, they are easily handled and repositioned by use of a forklift - even when laden with soil or superstructure.

Figure 1-2 Common pallets - the right hand pile is of 1.2 metre square pallets for house bricks. The left pile are pallets for roof tiles. The common industrial pallets are the former. Note the damage and consequent work required to recover even pieces of timber.

Note: 1.2 metres square is the standard pallet and is the most common - although I have seen 1.5 x 900mm for carriage of roof tiles and the printing industry has an enormous variety of pallets and skids - many of short-lived materials.

The photo show typical damage and therefore, my recommendation is to use newly made pallets. Recycled pallets not only require much repair and preparation for alternative uses, they are likely to have lost a significant amount of their original structural integrity. The timber may be rotten or damaged and it is risky to pass pieces though a thicknesser as there are likely to be embedded nails.

Pallets are;

- strong and rigid and can support very heavy loads;
- readily available;
- universal; and
- the dimensions are ideal for many utility purposes.

Therefore, this project is based entirely on the standard 1.2 metre square pallet. The planform can be reduced to half pallet or extended to multiples of 2, 4 or more, pallets with appropriate foundations and integral struts as described below.

The Structural Principle

The structural principle of the pallet itself is discussed later. For the development of the basic pallet into other utility structures, this project utilises the *Butterfly* and *Southern Cross* joints that I conceived as part of my design thesis, '*Furniteur*'. These require no special tooling and only handyperson skills. The joinery has been well tested in the form of balsa wood maquettes and now is ready to be verified in full scale pieces. It is my hope that a Mens Shed or AMSA in general, could support to construction of the prototypes.

I have purchased most of the necessary tooling. I am happy to purchase the first batch of pallets to demonstrate that the principle is viable - but I would like the advice of some retired tradespeople, to guide me in practical ways.

Why Mens Sheds?

This proposal is particularly directed to AMSA as a project that would be ideal for members to take on board and which could represent a steady source of income for Mens Sheds nationally. It could perhaps become the basis for an AMSA branded series of products.

I have titled the project, *Pallaissance* - being a combination of the words '*pallet*' and '*renaissance*' (re-birth) - it represents the re-use, re-generation, re-cycling and re-birth of the pallet. I call the finished products, '*multi-pallets*' (multi-role pallets).

Various configurations are described in the following pages.

Proposal

This proposal seeks a grant of $2,500 to buy pallets and other materials for the construction of a series of prototype structures. These will be proof of concept, will refine configurations and dimensions and will be used to develop photographs, drawings and assembly instructions which then can be passed on to other Mens Sheds.

David Robson
Designer
Brisbane, November 2014

The Project in Detail

Introduction

This project proposes design concepts for the use of particular commercial pallets (the most widely used pallet), in a variety of ways - multiple configurations, multiple purposes, multiple uses pallets, i.e. *multi-pallets.*

The Wonderful Pallet

The humble pallet has evolved to its current form and dimensions for many sound engineering principles. It is a simple and very efficient structure - provided it is properly made and undamaged.

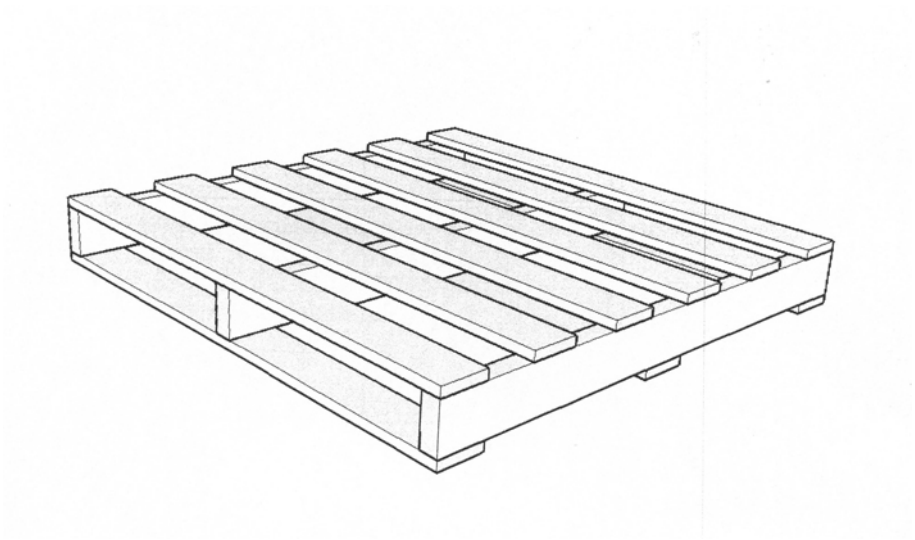

Figure 1-3 The most common square pallet with solid beams. The beams are 100 x 50mm and the struts are 150 x 25mm. The lighter pallet has less struts from 100 x25 mm timber.

The Structural Principles of Pallet Construction

Beams and trusses

In the above illustration three solid timber beams run from the lower left to the upper right of the picture. These a generally 100 mm deep and 50 mm wide. They can carry a significant weight as a bending load.

From the top left to the bottom right there are six struts on the top layer and three on the lower. Joinery is by simple lap joints, nailed.

The struts are kept apart by the beams which in this instance, act as vertical spacers.

The reason for more on the top is twofold:

- to share the load of the product that is carried on the pallet; and
- because these struts are in compression from any downward loads (weight), more are needed than the bottom layer.

The lower three are in tension and timber is very effective in this way - so less are needed. Therefore, the simple pallet is a very efficient structure.

However, '*herein lies the rub*'.

Vulnerability to damage

These lower ones are most vulnerable to damage from fork-lifts, mishandling, heavy landings, collisions and exposure to water, oils, soils and other contaminants - and so may be considerably weaker that originally designed. These are critical in judging the efficacy of a re-cycled pallet.

Choosing a pallet

Therefore, if a pallet is to be re-cycled and is to be the structural core of a new piece, then they must be inspected carefully to reveal:

- if any beam is damaged;
- if any strut is damaged (especially the lower ones which suffer the most wear and tear); and
- any signs of rot, decay, disconnection, protruding or missing nails or splinter, splits & slivers.

Apart from the structural integrity of the pallet one must consider the work entailed in making the pallet suitable for human contact and interaction. For some applications where the base timber is exposed and may be in contact with human skin, splinters, slivers and any exposed nails would have to be sanded, removed or covered.

Basic Configurations

Once the design concept is adopted, the potential configurations for our pallet are innumerable. Let's begin with the basic table-type structure.

Multi-Pallet Table

The basic configuration adds legs with cross-rail support to provide a surface at a working height. Obviously the height is tailored to the purpose - for children, or for adults - seated, standing or at wheelchair height

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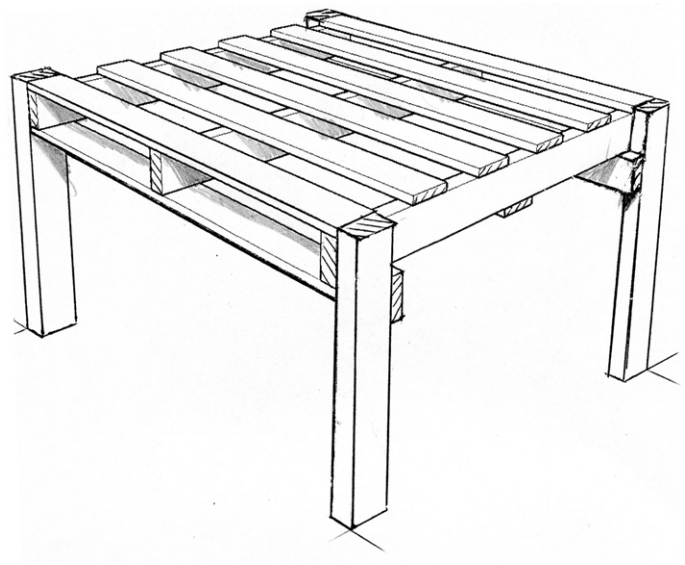


Figure 1-4 Palletable - Basic Configuration.

Multi-Pallet Potting Table with sides

The next evolution could be to add raised sides to create a potting bench or raised garden platform.

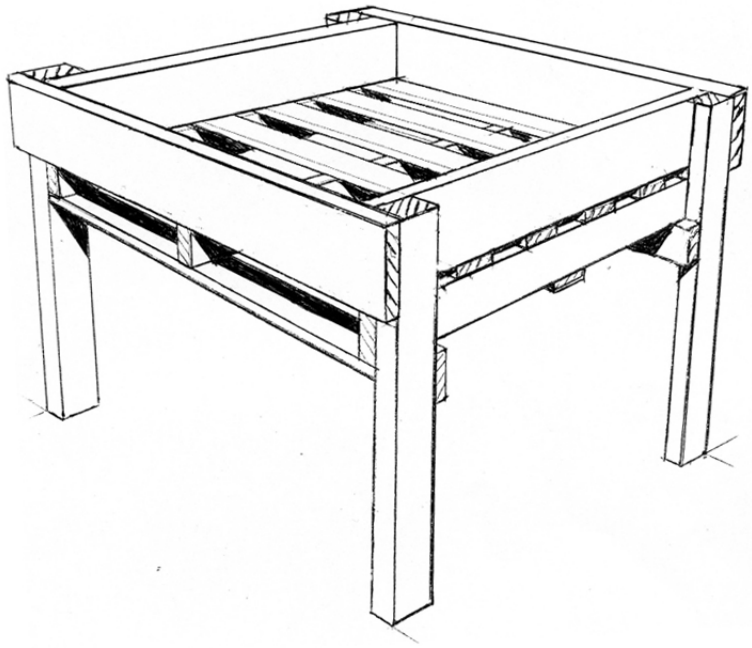


Figure 1-5 Potting bench or planter.

These may be personally identified and if the ends of the pallet are closed, it is more difficult to lift or remove the structure or, of course, they may be anchored.

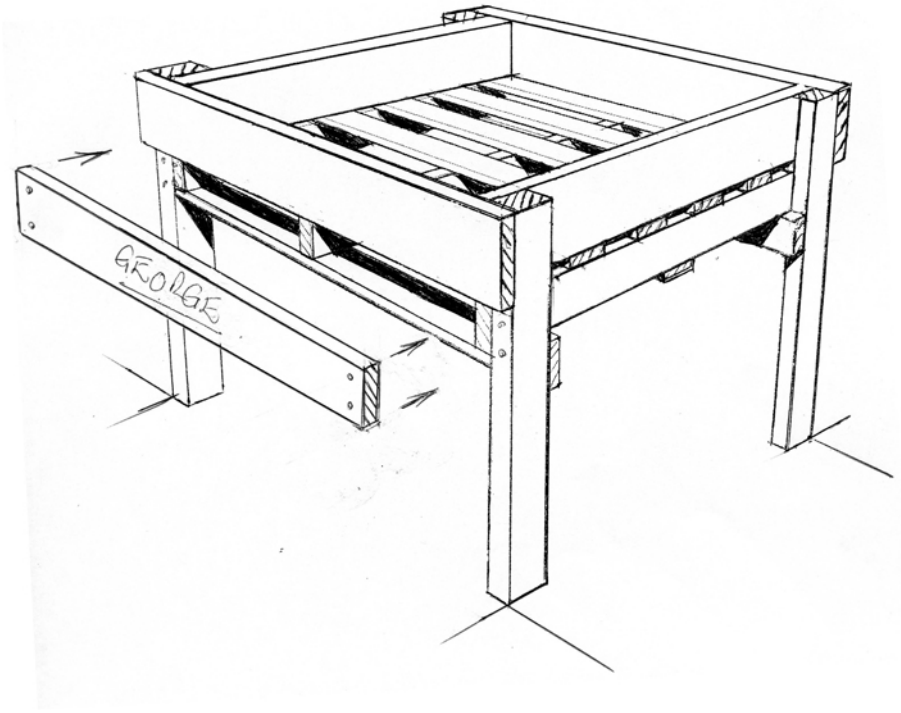


Figure 1-6 Personal space.

Multi-Pallet Trolley

Castors may be added to the legs for mobility.

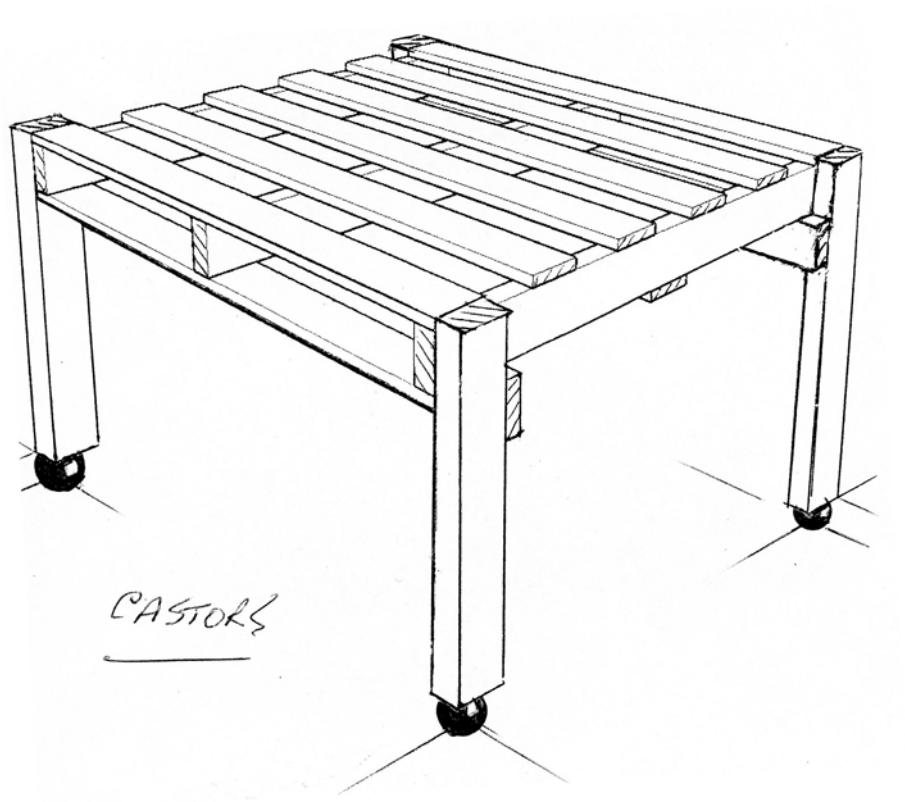


Figure 1-7 Pallet with castored legs.(indeed castors can be added to a pallet without legs to create a mobile platform or plant stand).

A handle may be added for better control and steering.

Multi-Pallet Bench

A smooth work-surface can be added to the top to form a very level and very strong workbench. This may be sacrificial and made from exterior plywood, masonite, melamine, chipboard, MDF or even, sheet metal. Some surface and edge treatment would be required for wet areas.

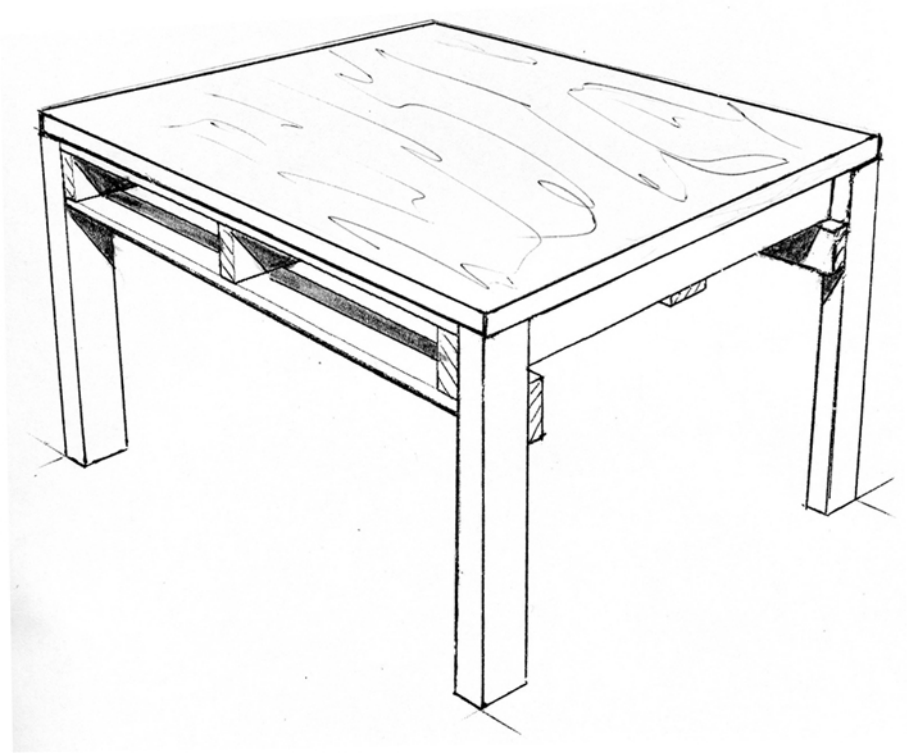


Figure 1-8 Pallet with work surface.

The top can be designed to overlap and have rounded corners and edge protection.

Note: A short-legged version (with rounded corners and edges could be used as a park bench or play structure - and could be anchored.

A vice fits nicely between the upper and lower layers of the pallet.

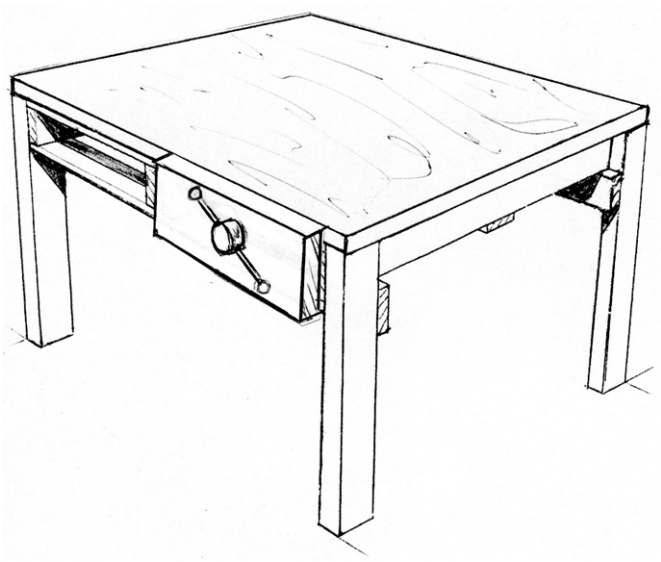


Figure 1-9 Bench surface with vice.

Drawers or trays are readily incorporated.

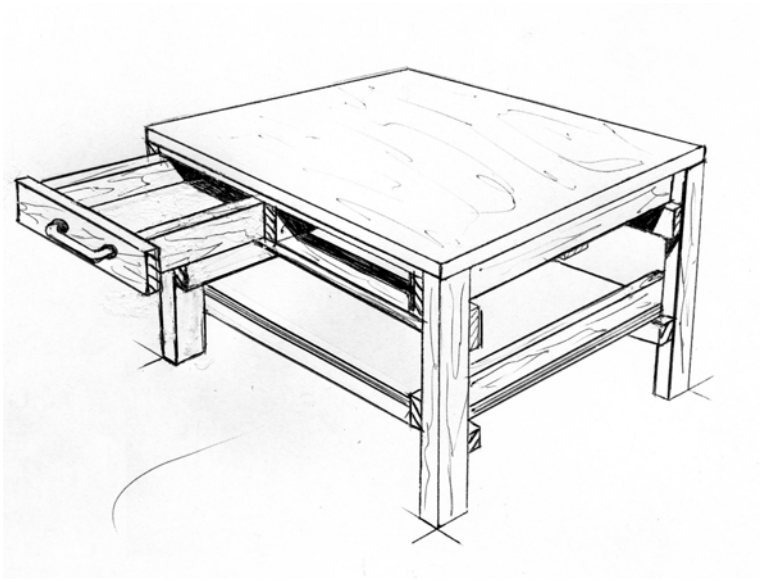


Figure 1-10 Bench with drawer and lower shelf.

A lower shelf may be added for tool storage but this may interfere with seated users.(knee clearance).

I can imagine a very low cost artist's taboret or work table positioned on a verandah or under a shade tree. It also offers a very economical barbecue table.

Multi-Pallet Games Table

The covered bench configuration can also be covered with ceramic tiles for a garden wet area or for games. The supporting layer of composite may require edge treatment to prevent wood rot. (It could also be covered when not in use ala a BBQ).

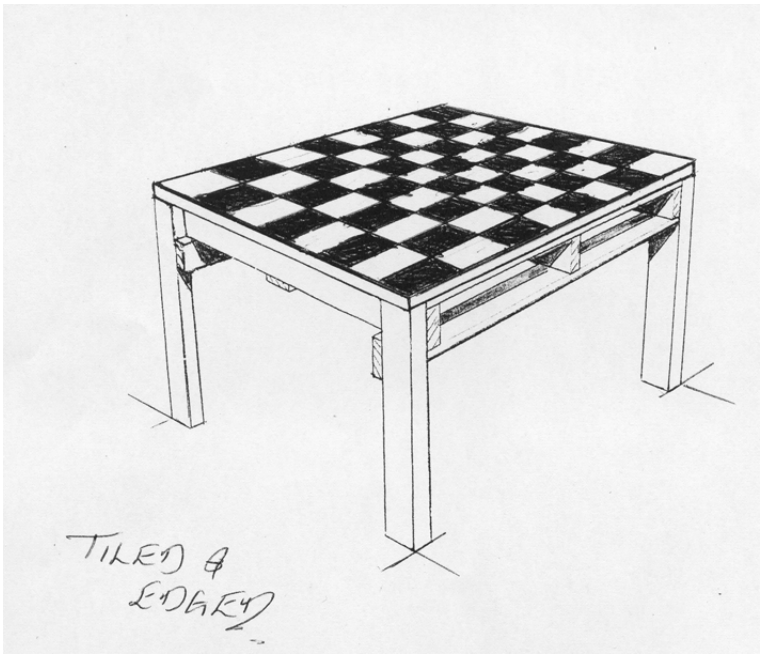


Figure 1-11 Bench with tiled top for barbecue, potting or games.

Multi-Pallet Shade or Secure Structure.

The primary structure may be extended to include an upper frame which can accommodate shade cloth, chicken or bird wire (for an aviary) or even security screening.

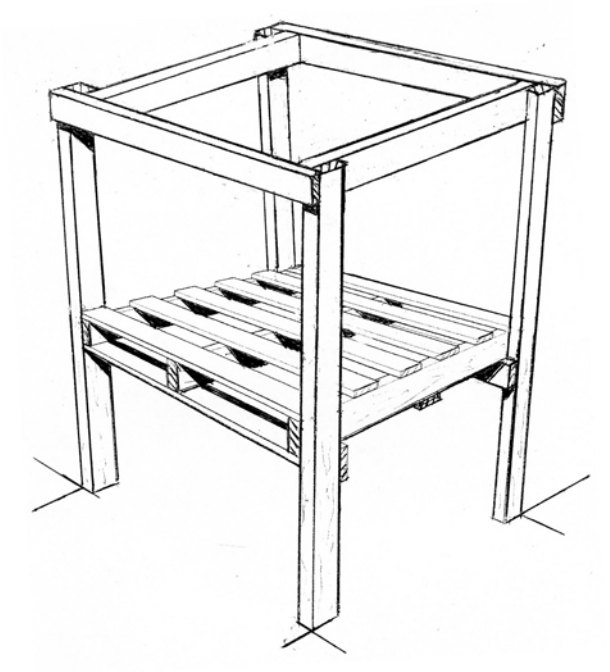


Figure 1-12 Integral upper frame can accept various coverings. Shear webs may be added for protection and greater rigidity.

Multi-Pallet Cubby or Chicken Hutch

A hutch, kennel, or cubby house may be added to the pallet core using the same structural joinery. The hutch may simply be rested on bricks or sacrificial skids - or attached to semi-permanent foundations.

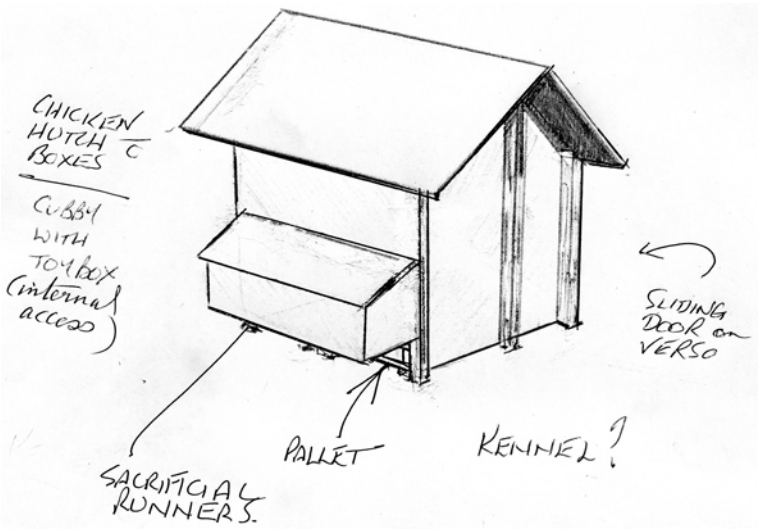


Figure 1-13 Multi-pallet with cubby house superstructure.

These structures may be as simple or as complex, as the maker desires. The structural principle remains the same.

Note: All of the above structures may be carried by through-poles or by forklift.

Multi-Storey Multi-Pallet

The structure may be extended vertically to accommodate a play area, sandpit or chicken run.

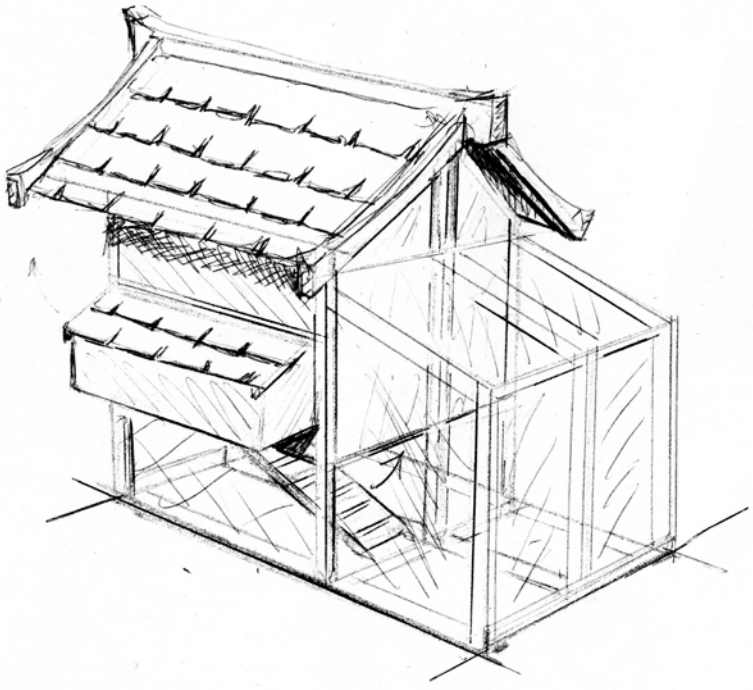


Figure 1-14 Japanese chicken house with run. Can be repositioned with poles or forklift!

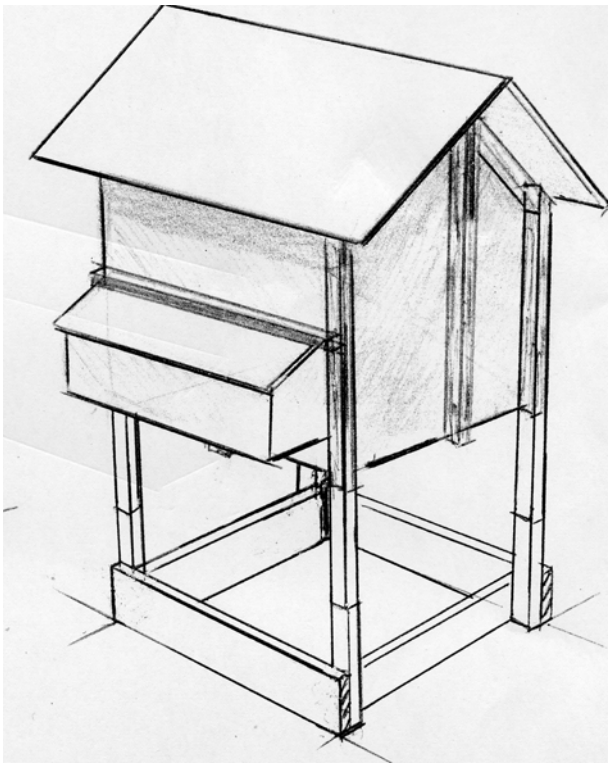
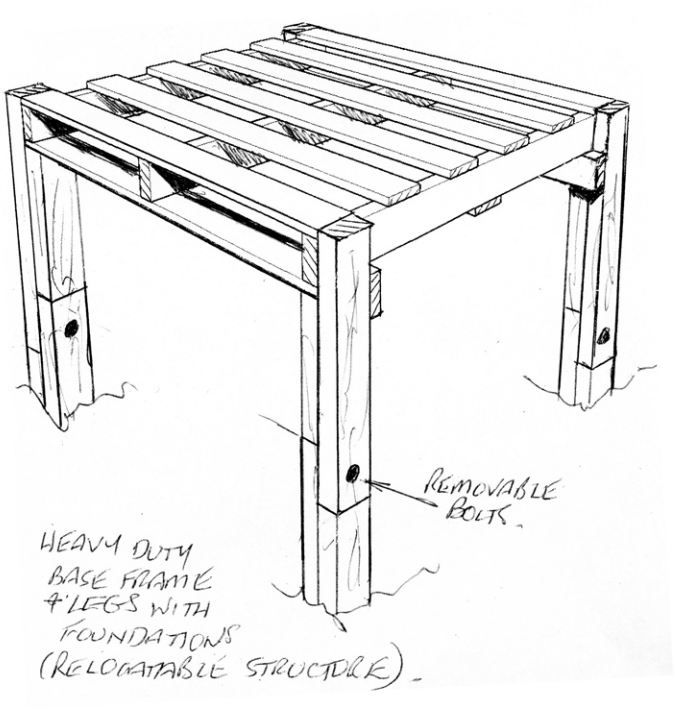


Figure 1-15 Elevated Cubby house with sandpit - shear webs would be added to provide rigidity and shade/wind screening.

Semi-Permanent Multi-Pallet



Anchored table with permanent foundations but removable structure.

Multiple Pallet Multi-Pallets

The basic single pallet configuration offers a floor area a little over one and a quarter square metres. Two pallets offer and area close to three square metres. These pallets mat be attached side-by-side or in tandem.

Three Square Metres (two pallets)

- Side-by-Side

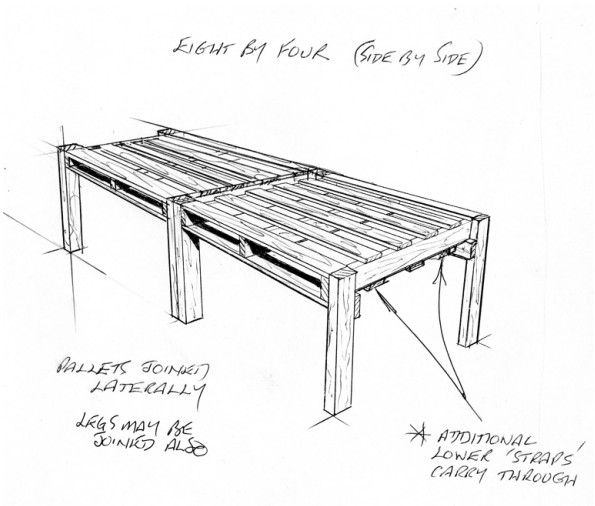


Figure 1-16 The side-by-side configuration uses struts like the pallet itself.

- Tandem

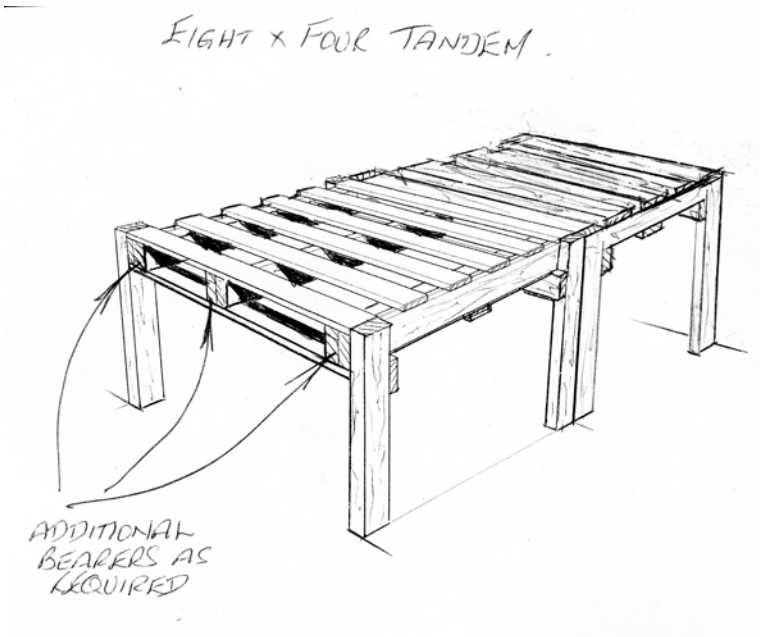


Figure 1-17 The tandem configuration uses extended beams like the pallet itself.

Tripallets and Quadripallets

Obviously three,four, or more, pallets may be joined to form a larger structural base.

Five Square Metres (four pallets)

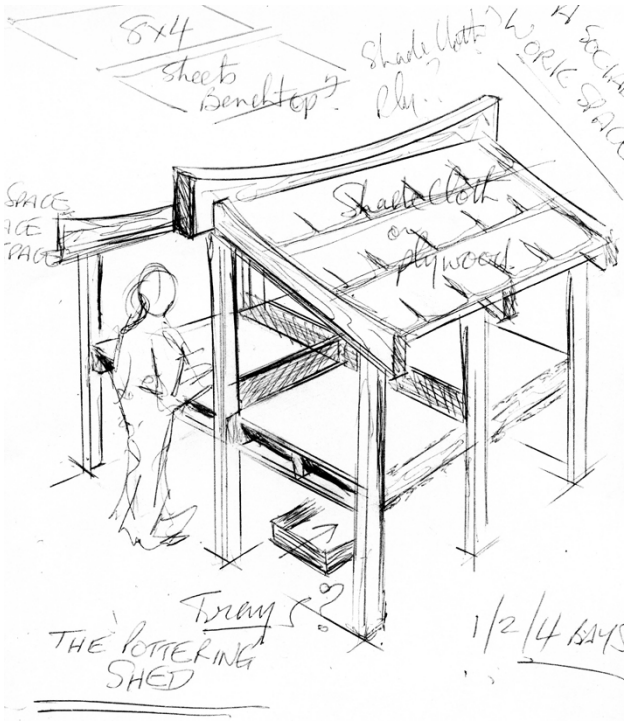


Figure 1-18 A sheltered cluster of four pallets - in this case with a work surface and partitioning.

High Strength Multi-Pallet

For very heavy weights and for greater rigidity, the legs can be doubled and anchored.

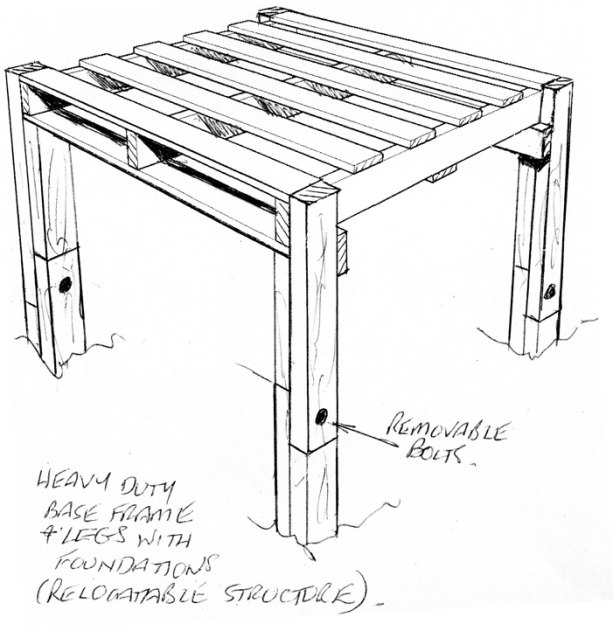


Figure 1-19 Doubled legs attached to foundations.

Stool/Plant Stand

While not made from a pallet this stool uses the same dimensioned timber from the same source as the new hardwood pallets (the supplier does offer the timber separately if desired – so there is no need to dismantle a pallet.)

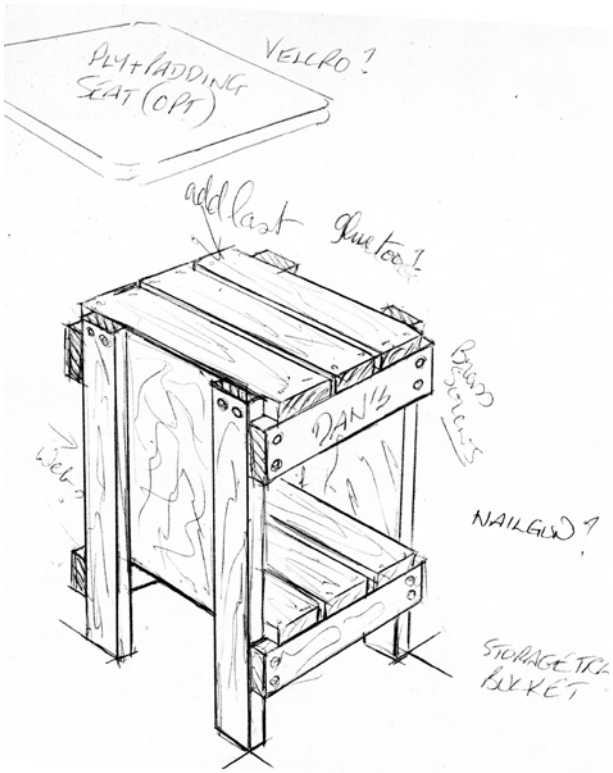


Figure 1-20 A simple stool utilising 100x25 mm hardwood - as used in the light-duty pallets.

Preservative Treatment of Timber

There are obviously many ways to treat timber for the particular application and environment in which the structure will be used.

Conclusions

This concept offers simple, multi-functional, utility structures for very little cost. The structures may be made by unskilled handypersons with very basic tools. If new pallets are used there is little preparation of the basic pallet necessary apart from the obvious splinter removal and sanding of areas where skin is likely. (For interior applications, pallets are available from DAR softwood).

Multi-pallets also offer a sound structural basis for even more innovative and more decorative pieces and they may be fun to make, i.e. they are indeed *anti-depressive*!

David Robson
Designer
Brisbane 2014