August 2014 Newsletter

Written by Ted Stubbersfield

Dear Reader

Getting Started in 3D Printing

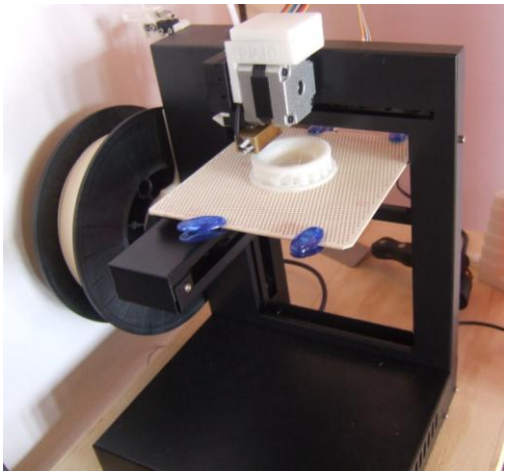


Figure 1: A basic fused deposition modeller

Figure 2 Forest Table by WertelOberfell

This article is contributed by Dr. Jennifer Loy, Program Leader Industrial Design, Convenor 3D Design Digital Media, QCA & Griffith School of Engineering, Gold Coast campus, Griffith University. QLD, 4222 Australia. With the expiration of patents and the availability now of free software, 3D printing is becoming less costly and will eventually become an everyday reality for my younger readers. For images of 3D printed bollard tops follow this link and scroll down till you find it.

We hear in the news about 3D Printing, we are even seeing desktop 3D printers appearing in shops such as Office works and on Amazon, but how to get started?

The first thing to know is that the term 3D printing, or additive manufacturing, refers to a range of technologies suitable for different materials and different applications. The most basic ones are called Fused Deposition Modellers. These are essentially filaments of material heated and extruded to build up a shape, rather like using a glue gun. **Figure 1: shows basic fused deposition modellers using a single filament of ABS plastic**

These range in price from approx. $2,000 up to approx. $70,000 depending on build size, number of print heads and the materials used. Designing for printing on these machines can be frustrating to start with, as you need to understand how to design to reduce the necessity for support scaffolding in the build, but a good tip is to design objects that grow rather like a tree and so do not require much in the way of support structures (**see figure 2 Forest Table by WertelOberfell).** If you are new to 3D computer modelling, you can try it out using free software, such as Google Sketch Up 3D, Autodesk 123 or TinkerCAD. They take a bit of getting used to, but are good to practice on. It is also possible to generate models using photographs of an object you have made in clay or wood with Autodesk 123, though these facilities are more for fun than anything work related.

If you are thinking about printing in metal, then you need, realistically, to have at least a million dollars in your pocket. Although this is the area that has seen the most dramatic developments in the last few years, it is also very challenging. Working with titanium powder can be dangerous as it is volatile and also needs argon gas in the build chamber to keep in under control. This is a heath hazard and heath and safety nightmare.

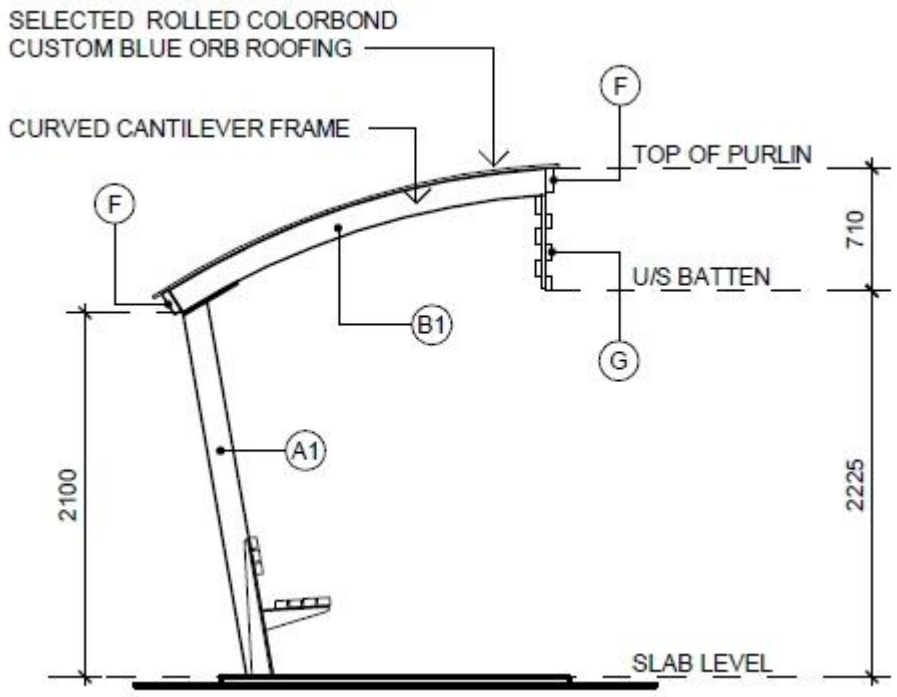
My recommendation for anyone thinking about working with 3D Printing is to attend a short course – libraries, and facilities such as The Edge in Brisbane, run day courses in 3D Printing, and to visit an online service provider such as Shapeways or iMaterialise for further information. This will give you an insight into the types of objects you can print and inspiration for what you can do. Happy Printing!

Developments at Outdoor Structures Australia

Expansion of Premises: Nigel Shaw, the CEO has signed the documents to lease a much larger premises in Ipswich to allow for the expansion of the business.

Purchase of a CNC Router: A CNC router with a bed size of 4.2x1.2m has been purchased. This is going to allow us to manufacture bollards with your, or your project's logo. Signage should be straight forward as well.

New Range of Shelter Sheds: We have been granted the rights to manufacture a very attractive shelter designed by Peter Shepherd of Continium Landscapes - thank you Peter. It is available in a 2.7 and 3.6m long version. It will not be too long before we have images of installed products.



OSA Constructions: Installation was always my weak point. We had and still do work with some really great companies and had/have no hesitation in recommending them. They were more set up for the larger jobs though. Nigel has started a new company OSA Constructions which can give an installation price.

New Sales Representative: Nigel has appointed Keith Smith to represent Outdoor Structures Australia. Keith is an experienced business development professional, with over 20 years of

sales and marketing experience, having held senior sales and management positions across a diverse range of industries. He joins OSA from Waco Kwikform, a multi-national organisation providing scaffolding and formwork solutions to major building and construction projects. Keith has previously operated his own business as an independent supplier and consultant to the building industry.

More on Good Handrail Design

Last month I wrote on how to design handrail for maximum durability and aesthetics. Click Here for the link. I included an image from the Cairns marina showing a handrail which I said represented the very best in handrail design. Unfortunately my image could have been better as the details were not clear. My friends at Ports North kindly sent a better one to share with you. Note, sloping top, gap between rails, fastening from underneath and centre supports. Stainless posts are great (but so is durable hardwood).

Our Commercial Barrier Guide will help you with handrail design.

Induction Course for Timber

Recently I was asked whether I could deliver an Induction seminar on the use of timber, particularly weather exposed hardwood. I was wondering whether there is a demand for such a program on a wider sphere. I would appreciate feedback from my readers on firstly, whether there is a demand and secondly what subjects need to be addressed. Additional consultants can be bought in to deal with subjects outside of my area of expertise. Topics could include but not be limited to:

Timber Preservation.
Hardwood Grading.
Timber Decks – Designing for Durability,
Utilising Small Diameter Hardwood.
The Seven Deadly Sins of Timber Design. .

Ipswich City Builds a Great Boardwalk

Nigel Shaw CEO of Deckmaster (Left) with Ken Swan (right) and Paul Ploetz from Ipswich City Council of the Open Space Construction Team, Ipswich City Council

Nigel Shaw, CEO of Deckmaster and I recently visited a boardwalk we supplied to the Pan Pacific Peace Gardens in Redbank, Queensland. We met with Mark Mathewson, Coordinator of Infrastructure Services, Open Space Construction Team and Ken Swan and Paul Ploetz who made it happen. Ken and I have spoken often and he brought to the project a detailed understanding of building for durability and a passion for doing it well.

The Pan Pacific Peace Gardens, started in 1992, was constructed to commemorate soldiers who camped on that site before embarking to fight in the Pacific during to of World War II. "Inspired by

Ipswich's history, the Pan Pacific Peace Gardens feature memorial plantings, formalised pathways and boardwalks that wind through extensive wetlands. The gardens also act as a wildlife corridor linking Redbank Rifl e Range with adjoining lands and rivers". Initially this project was a "gift" by a power distribution company and appears its implementation was budget driven as sadly it embodies poor timber design and supply and as a consequence the timber bridges and boardwalks are not faring well. I can understand but not excuse a resistance to using timber.

One boardwalk, passing through the Bernard Treloar Rainforest Collection had to be replaced. Being in a shaded area this boardwalk should have lasted for a very long time but it was thought to be only 12 or years old when replaced. I must stress, if you are not prepared to do exposed timber well don't do it at all. This time the design of the replacement and construction of the new boardwalk was carried out in house by Ipswich City Council. This boardwalk uses 120x35 Deckwood and 150x75 Joistwood. It follows our design and construction guides closely The result is superb and is a credit to Ipswich City Council ands its employees.

Fortunately the old concrete foundations were still in excellent condition. A layer of Bayer's Kordon anti termite barrier was inserted between the foundation and the timber sole plate. At the end they terminated in concrete with the foundations integrated with approach path. This avoids trip hazards. The design ensured that there is at least 300 mm of clearance between the joists and the ground.

While the shade from the trees protects from UV, when building in these situations it is especially important to have self cleaning decks. The patented Deckwood profile allows leaf litter to drop through. Equally important is to lift the kerb up off the deck. The spacer is 75mm to ensure the footplate of a wheel chair does not clash. Changes of direction are done through fan tapers. Our standard tapers go from 60 to 90 .mm. All the timber was coated all round with CN oil and the cut ends were sealed with CN Emulsion. See here for guidance about when to use CN Oil and Tanacoat.

All in all, a very commendable job

Three other Ipswich City Council jobs featured in previous newsletters:
Observation deck
Bird aviary, Queens Park
Small boardwalk - scroll to the bottom

Blog being written for Timber+DESIGN Magazine

My sixth blog written for Timber+DESIGN web magazine is on Slips Trips and Falls. It is proposed to be out on August 28th. Timber+DESIGN is a very useful magazine for those interested in timber that has been used imaginatively. .

Click here for a link to the website of Timber+DESIGN magazine.
Blog on whether decking should be a product in its own right
Blog on whether plastic decking all its cracked up to be
Blog on H4 and H5 treatment
Blog on whether to use stainless or galvanised fasteners.
Blog on using the correct decking fastener.

To be on the mailing list, contact Kay Phillips through this link.

Next month's blog is expected to be on Decking on Fibre composite joists.

Bridge Quote Requests

If there is any doubt that OSA make the best kit bridges in the country look at the Berrinba Wetlands Project . Not all bridges are equal. After encountering three bridges in one month that did not meet the Bridge Code I wrote the May 2012 newsletter. Refer to it when assessing the suitability of quotes.

Steel bridge Quotation Request Form

Timber Bridge Quotation Request Form

More information:
If you have timber road/rail/heritage bridge issues,
we suggest you talk to:
Mr. Dan Tingley
Senior Engineer
Wood Research and Development

Outdoor Structures Australia

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