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# Learning how to build traditional timber frames

*A Personal Journey*



Growing up in the Goldfields of Central Victoria, and with a dad that is a church minister, I was exposed to some beautiful arched timber roof frames in the stone churches that had been funded by the wealth of gold pulled from the ground in the 1800s. I'd often spend the Sunday Services looking up to 'heaven' marvelling at the timber structures holding up the roofs. This and a love of timber, building

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and making things has, over the course of 40 years, lead to a discovery of the beauty of the way buildings of old where made from timber frames that were held together with nothing more than the timber itself.

I wanted to learn how to do this, to be able to build using mortises, tenons and timber pins, to be able to use large and often natural curved beams made of Australian hardwood timbers from our local area. This, I felt, would allow me to build some beautiful and rather unique buildings and structures, both for our camping ground Grampians Paradise and for our family.

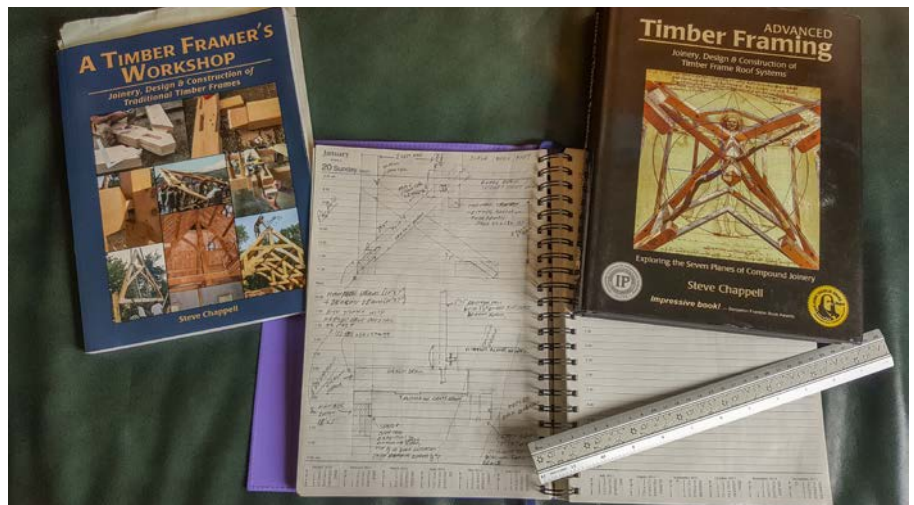


## Reading to learn

It's been a bit of a journey. First, some work with my engineer delivering an understanding of the size of timbers needed for curved beams, followed by acquiring a number of books on timber framing from Amazon. I had no idea as to what to get, so I purchased five different books by different authors and started trying to build up my understanding of traditional timber framing. This was a fantastic start; for a year or more, I would pour over the books learning as much as I could – general principals, how forces move through the timber, how the joinery was executed.

One book in particular, *A Timber Framer's Workshop* by Steve Chappell, stood out, giving me the most detailed understanding of the technique. But no matter how much I read, there were still large gaps in my understanding of timber framing.

As the title of the book may hint, I began thinking that attending a workshop was the next step in the journey toward being able to fulfil my goal of building traditional timber frames; attending one of Steve Chappell's 'Fox Maples School of Traditional Building' workshops in Maine, USA would be fantastic. At the time this seemed like nothing but a dream, being so far away and requiring a bit more money than was available. Still, I was inspired by my wife, Vanessa, who would regularly head off to Queensland or New Zealand to her next course in Hawaiian massage or natural therapies, as she expanded her knowledge and experience.



## Adelaide Hills workshop

In 2016 I headed for the Adelaide Hills and attended a week-long Timber Framing Workshop with Timber Frames of Australia, where we learned the Scribe Rule process of laying out the joinery, how to cut tenons and mortises, and assembled a small frame of six posts, seven beams and 14 wind braces.

Scribe Rule is a wonderful traditional technique that allows you to transpose the shape of one timber onto the timber that it is to join to. Timbers, by their nature, are often neither square nor straight by the time you come to build with them. In traditional timber framing, where the timbers are large, the mortises and tenons and mating surfaces need to come together in the frame perfectly to allow the frame to fit together when finally assembled. This allows the joinery to effectively transfer the forces applied

to them through the frame all the way down to their foundations.

In some ways, traditional timber frames are more comparable to heavy steel framed buildings. Both are modular and all the parts are made separately in the shop, requiring careful measuring, and precise assembly of each individual beam, post and brace. They both must come together 'perfectly' on site on the day of raising (assembling) if the frame is to fit together without major problems or fuss. With both, if the individual components are made correctly, they all lift in to place very fast; over the course of a few days the building goes from a foundation to a completed frame in what almost seems a magical transformation.

The Adelaide workshop was an amazing experience, giving me an understanding of the scribe rule process, how to cut basic mortises and tenons and fit together a basic frame.





From here on in, I continued to work on expanding my understanding with more reading, and going back over my notes, photos and time-lapse video I'd taken during the workshop. As helpful as all this was, I still felt there were large gaps in my understanding of timber framing, and therefore I did not have the confidence to start designing (and building) my own timber frame project. Somehow I needed to gain more knowledge and skills.

## Workshop in Maine, USA

In February 2017 the announcement was made that the American Spring Fox Maple School of Traditional Building Workshops were to be held in June. These were to be special event workshops, as they would mark the 35th anniversary of the first Fox Maple Workshops.

If only I could go... I checked plane flight prices to USA – they were cheap – and the exchange rate was good; things were starting to look promising. On discussion with my family, it was decided – I was going! The workshops and plane tickets were booked.

Arriving in Maine, USA at the Fox Maple Campus I was not entirely sure what the two weeks of workshops were going to entail, but I knew that at the end

there would be an almighty push to raise a large frame that had been designed and cut on the workshop.

The first few days were inside the magnificent traditional timber framed library, with thatched roof, straw bale walls and clay render, watching slides of traditional timber framed building from around the world, the joinery used in them, building up an understanding of the traditional timber framing techniques and design principles. This morphed into working on designs for a frame we would build, running trigonometric calculations as we rescaled the building size, adjusting roof pitch and trying various options to come up with a pleasing simple two-storey building of three 'bents' (frames) that would fit the sizes of timber that had been delivered from the mill and would be achievable in a 6-day workshop.

The timber was amazing – eastern white pine, straight as a die, easy to work, strong, stable and beautiful. Being 'planed 4 sides' the timbers were truly square, which allowed for a different layout rule, the Mill Rule, to be used. With the Mill Rule, a reference corner is chosen on each timber from where all measurements are taken. This is done after grading of the timber and choosing where each individual timber will go within the finished frame.

Once the measurements were marked out on the timber, checked and rechecked, the lines to be cut were scribed into the timber with a knife with the highest level of accuracy that can be achieved – there are no plus or minus tolerances. Saw cuts were made off the line (between 1.5 to 3mm) and then the faces and cheeks of the tenons were paired back with a chisel, until they were exactly to the scribe line and absolutely square. This is done so the joinery will fit together perfectly when the frame is assembled.

The same principles were applied to cutting the ends of beams and mortises, though the mortises were hogged out with a chain mortiser. Once again, the finishing of the mortise was done with large framing chisels, paring back the mortise faces to the scribed line, making sure the mortise width was exact and all faces truly square.

As the week went on, intensity raised, confidence among us students grew and the complexity of the joinery increased. On the last day, the tempo increased further, all without compromising the Fox Maple principle of 'Perfection and Grace'. As the day drew to an end, the bents were assembled and the frame raised. That evening we sat around the campfire under a frame we had built in a week, satisfied in what we had achieved.





## Advanced workshop

After one day's rest, it was all on again, this time for the Advanced Workshop. This followed a similar path to the Introductory Workshop we had just finished, but dealt with much more complicated joinery that would allow the building of a dormer window with valley rafters between purlins, and a jack rafter that could be added to the frame we had built the previous week, all joined with mortises, tenons and timber pines. There is not a single bolt or screw in this frame design at all.

The design principles were the same, but as we were now dealing with multiple rotations through a number of angles (between the planes of the roof and dormer, creating different angles along the valley rafter), the trigonometry was much more involved and it was increasingly important to find ways to visualise in the mind's eye the frame we were building, how the beams would face onto each other and the joinery that would have to be cut.

This was increasingly difficult to visualise, so the solution was to cut practice joinery on offcuts of beams, test fitting them to prove the design of each joint and that they would actually fit together. This is a practice I would recommend doing on any joinery, if ever

there is any uncertainty to the joinery you are attempting to cut. Better to get it right on offcut timber, or even purchased short lengths, before starting on those expensive beams you have carefully selected for your timber framing project.

Once the practise joinery was proven, it was onto the real thing. From confused minds, clarity slowly came; the joinery was cut and as the tempo increased, confidence was gained. Once again on the last day the drive was on to finish the frame, assemble the parts, 'tune' the joinery with a framing chisel where it was not so perfect and bring together some amazingly complex joinery. While for many of us we will never need to use some of the more complex joinery we learned during the Advanced Workshop, understanding how it works, the principles behind it and having gained skills in its execution, the rest of what we have learned (at least to me) seems so much easier.

## Where to from here?

It is 12 months since the Fox Maple Timber Framing Workshop. I am now confident to tackle a range of timber framing projects, both the design and construction. Many drawings have been made and changed as the designs are

refined. Engineering has commenced, and many beautiful timber beams of red box, yellow box, and river red gum are now on site ready for the commencement of my project. I'm still reading about timber framing (mainly as references to individual issues I'm wanting to solve or confirm) and regularly watch YouTube videos on timber framing to keep it all fresh in my mind.

Added to this I've set about learning to use Google's 3-dimensional modelling programme SketchUp to help me design some of the more complicated joinery I'm wanting to use. It's amazing as an assistant for visualising the frame and joinery, confirming measurements and remembering how I solved a particular design issue months ago.

As it turns out, I am wanting to use some reasonably complicated joinery in the frames that I am designing (though not as complex as in the Advanced Workshop). One of the projects I am designing is a cottage for our 21-year-old son, including dragon beams and some naturally curved timber. The second project is a curved stringer timber framed bridge spanning around six metres. Both projects will be scribed to foundation stones.

There is one more timber framing workshop to go – in October this year. One of my two projects is likely to be the subject for an upcoming Fox Maple Traditional Timber Framing Workshop that we will be hosting, here in Victoria, at our home and business Grampians Paradise Camping and Caravan Parkland. This workshop will be 10 days long, from Sunday 21 October through to Tuesday 30 October 2018. ♦

*For more details on the Workshop see the 'Coming events' section in this issue, contact Aidan or check the Grampians Paradise and Fox Maple websites.*







◆ **Grampians Paradise**

Camping and Caravan Parkland, on the edge of the Grampians National Park and near to Halls Gap.

03 5356 6309,

[www.grampiansparadise.com.au/timberframing.html](http://www.grampiansparadise.com.au/timberframing.html)

◆ **Fox Maple**

Builders of timber frame houses, education of techniques through workshops, sharing of information through books.

[www.foxmaple.com/workshops.html](http://www.foxmaple.com/workshops.html)

◆ **SketchUp Free**

Simple, easy to use online 3D modelling tool.

[www.sketchup.com](http://www.sketchup.com)

