TIMBER FRAMING SHOP TIPS & ANCIENT BUILDING SECRETS

FORREST RAND

ARLINGTON TIMBER FRAMES & TIMBERFRAMEHOUSEPLANS.COM

Timber Framing Shop Tips
&
Ancient Building Secrets

Originally:
Instructions for using Shop Prints from TimberFrameHousePlans.com

by Forrest Rand

Tools Required:

• **Long Chisel** – If you buy one tool for this project, let it be a Barr 1.5" Framing Chisel, available at barrtools.com. A sharpening stone is also needed. Lee Valley sells them as do Barr Tools – stones, that is, not chisels. Lee Valley dropped their line of Henry Taylor chisels from England many years ago, and replaced them, inexplicably, with Sorby Framing chisels. Sorby may make a fine chisel, but I don't recommend it for timber framing.

If you go on to other timber framing projects, or want to do this one more efficiently, add a 1" framing chisel to remove wood easier with less pounding. Next would be a 2" framing chisel for slightly quicker and more accurate paring of tenons.

• **Wooden Mallet** – Don't hit your chisel with a metal hammer. Ever.

• **Circular Saw** – often called Skillsaw. The best one for the job is a 8¼" Makita. A 7¼" will also work, but not cut as deep. A circular saw *can* be replaced by two good quality hand saws – a rip saw and a crosscut. Sawing by hand is very physically demanding and will slow down your project big time, *but* if you're a 'journey not destination' type person, you may want to go this route. It certainly is quieter. I use this method when I build Inuit kayaks.

• **Framing Square** – buy a full size one, and keep it clean enough to read the numbers.

• **Utility Knife** – Along the lines of Ofal.

• **Tape Measure** – Imperial, unless you want to convert to metric. 1" wide is best, 25' long.

• **Bevel Square** – Don't go too cheap; it needs to stay in its setting when handled.

The Main Rules of Timber Framing:

1. Measure twice, cut once!

This is the main rule in timber framing, the main rule in all of carpentry, if not in all of life itself. It's a half brother of "look before you leap". I have read that originally it was "measure thrice, cut once!"

Have someone else check your layout. Of course, it will look right to you – you just laid it out. In our shop, the layout guy checks it over, the cutter checks it, reads all the notes in the prints, and finds the stick in the floor plan, section, etc. Then he gets another checker to go over it the same way. Mistakes are sometimes found in any of these three checks.

2. Lay out and cut the male members first

This is a major rule of timber framing in my shop. It's easier to lay out a mortise to match a stick that is already cut, than it is to cut a mortise, then run around looking for a stick that size.

Some Framing Principles:

Roof slopes

Roof slopes are measured by rise and run, as are stair calculations. It's a matter of ratio. In a 12/12 slope roof, the rafters rise 12' vertically for every 12' of run. In this case the angle is 45 degrees. A 10/12 roof rises 10' for every 12' of run.

Run can be thought of as the horizontal distance the rafter travels toward the ridge.

Plumb Cut / Seat Cut

Seat cut is a cut in the horizontal plane, lined up exactly parallel with the earth's horizon.
Plumb cut is a cut in the vertical plane exactly perpendicular to the horizon.

They don't need to be cuts as such, but are lines drawn to represent vertical and horizontal. These lines are what keeps your structure oriented in its proper place, and every calculation is made from these two basic constants.

They are particularly important in roof frame calculations. See Diagram A (next page).

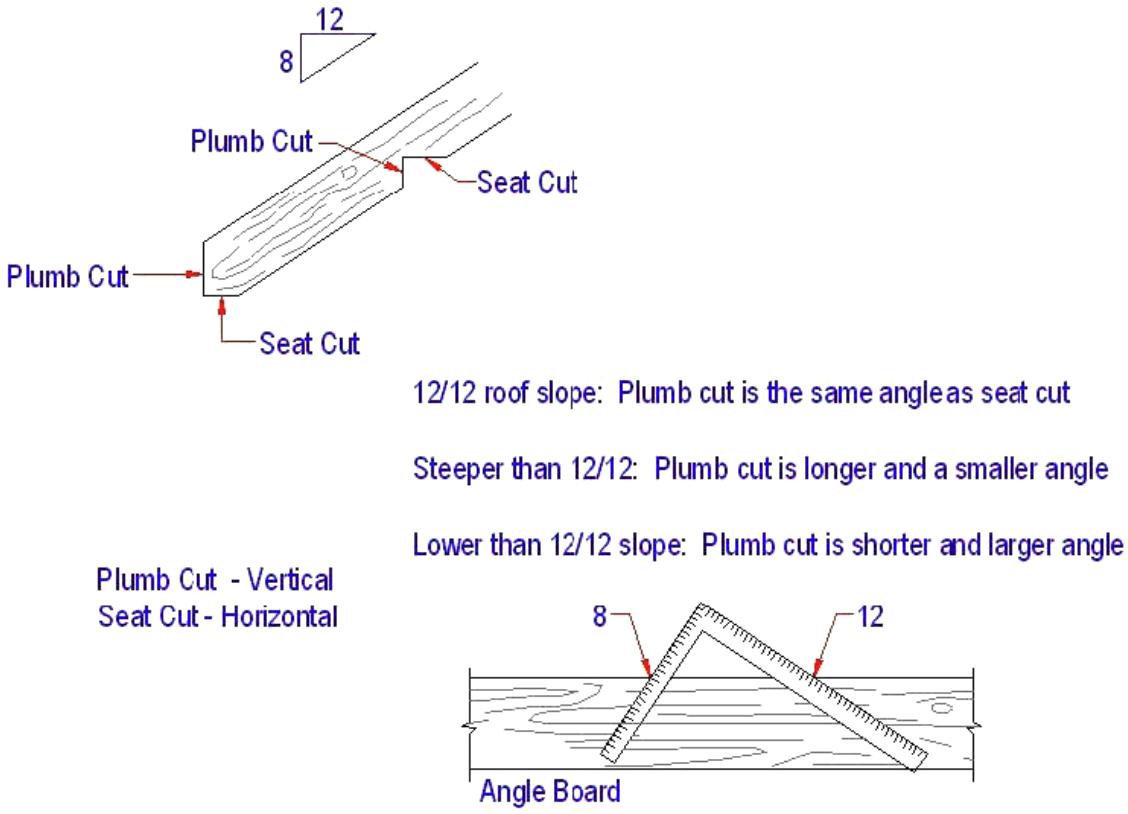

Diagram A – Plumb & Seat Cuts

This shed roof has an 8/12 slope. The rafters, the top plate notch and the rafter tails are calculated with plumb and seats cut as indicated in the diagram.

In every situation, plumb cut and seat cut add up to 90 degrees, no matter what the roof slope.

I recommend establishing both seat and plumb cuts at the beginning, drawing them on a clean, straight piece of board, and keeping it handy for the whole project. You can establish these with a framing square, or use the run over 8" as I have given in the drawings.

Set your bevel square from your angle board, and check frequently, especially if you have dropped or bumped the bevel square.

Later, as your skill level improves, you will add more angles to the board.

If there are dormers or valleys in your roof, you will want to add the seat cut and plumb cut of the valley.

Ancient Building Secrets

1. Three Four Five

This rule was old when God was a boy. It is the great grandfather of the Pythagorean Theorem.

It has been adapted to be used with only basic math skills, not trigonometry.

While assembling bents on the ground prior to a raising on the Gaspe Peninsula, I have heard French-speaking carpenters call it, “Trois quatre cinq .”

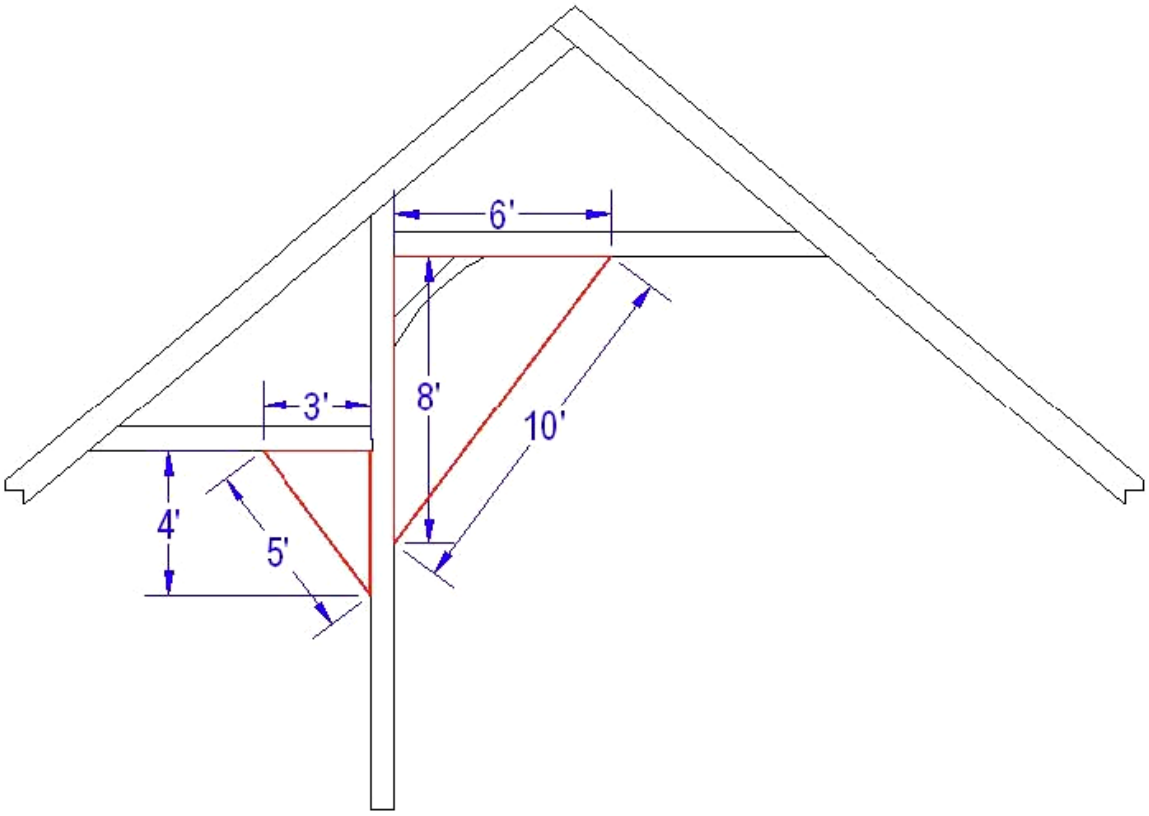

Diagram B – Rule of 3-4-5

2. The Rule of 17

This rule likely goes back to the Middle Ages.

It is applied to valley or hip rise and runs of roofs that have equal slope on both sides of the valley.

For example, a 10/12 roof with a 10/12 dormer roof, or a wing on the house that has a ridge perpendicular to the main roof, is an equal slope roof. In these cases, the rise and run of the valley (or hip) rafter is 10/17.

An 8/12 roof with an 8/12 dormer? The rise and run of the valley is – you guessed it – 8/17.

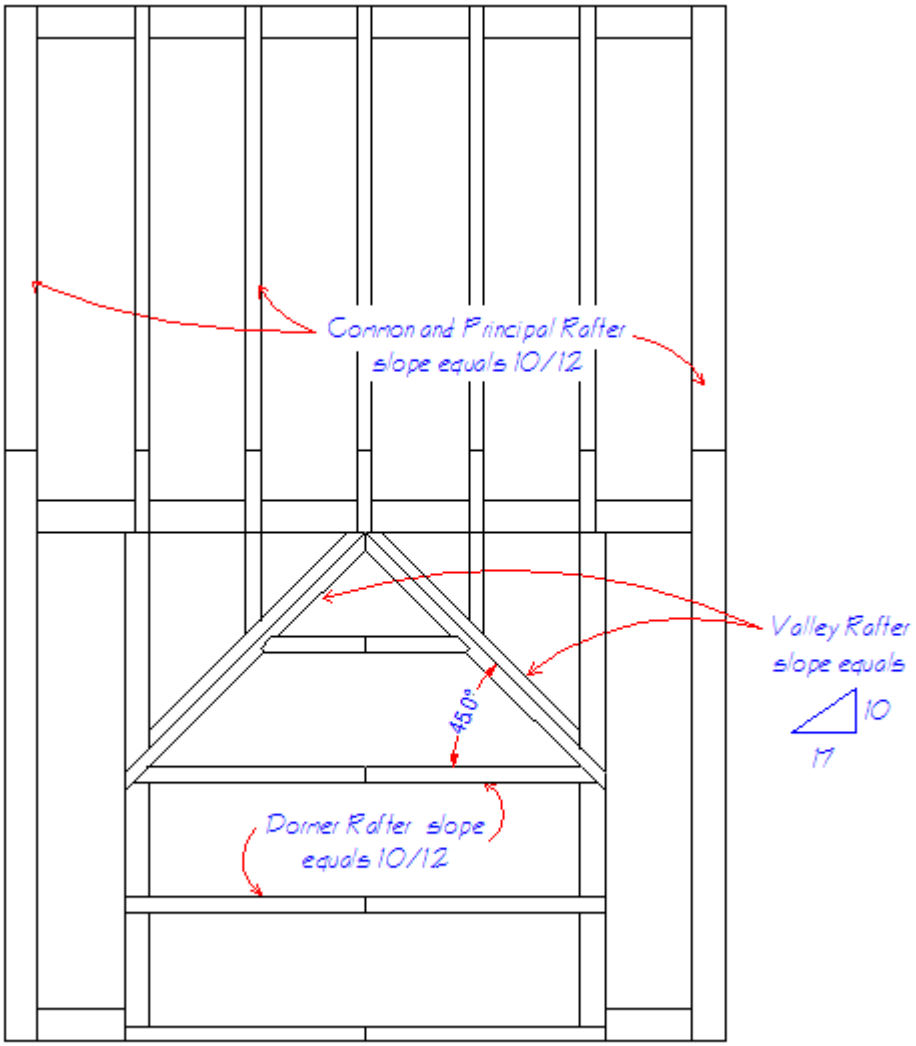

Diagram C - Rule of 17

Square Rule and Mapping

If you can get timbers from the mill, planed to the exact size with a 4-sided planer, square rule will not be a concern. If you are using rough sawn timber, square rule is a good method to keep everything on track, especially on larger frames.

On small projects, mapping is probably the easiest way to stay on track, and it is the method we used to lay out my own Ultimate Shed (see [http://www.timberframe-houseplans.com/gallery/Shed-12x20.shtml).](http://www.timberframe-houseplans.com/gallery/Shed-12x20.shtml))

Mapping is simply recording all irregular dimensions of the members at the areas of a joint. This is best done with little scribbled notes on the plans. In our shop, the timbers larger than 6x6 and 4x7 come from the mill roughsawn. We plane them into square, and as close to the desired dimension as possible. We use a Mafell 13" hand held electric planer, but our dimensions are less than perfect on half of the sticks. We use a combination of square rule and mapping.

Let's use the layout and cutting of the bent girt mortise on each post to illustrate square rule. The mortise has a 1" shoulder, that could be measured from the surface of the post if it were a perfect 8" post. If it is not, measure 7" in from the outside of the post. If the post is 8¼", the mortise shoulder would be 1¼" deep. If the post is 7 7/8", then the shoulder will be 7/8" deep. In both cases, the bent girt will fit, and the building will be exactly 12' wide. When the shoulder depth is established, the tenon mortise is added to that.

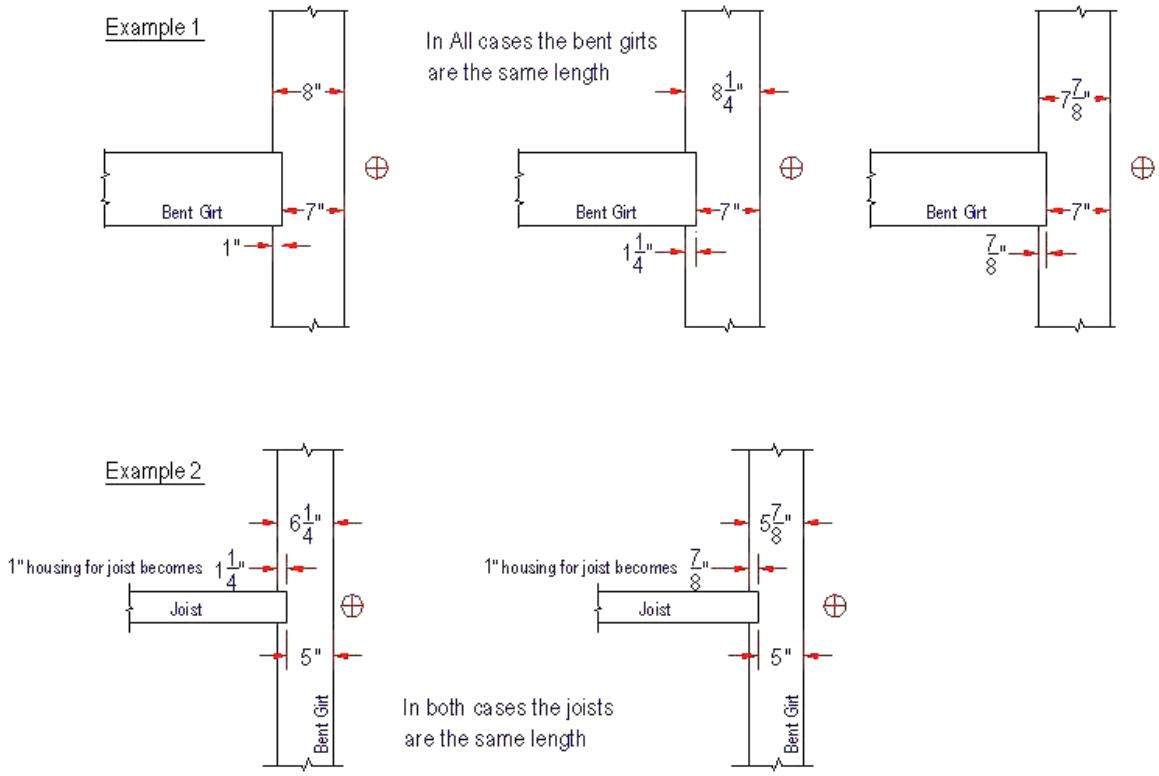

Diagram D – Square Rule

Now let's do that with the mapping method. We make a note on the floor plan showing which posts are oversized or undersized, and how much. We note on the plan the length adjustment needed on the bent girt.

The outside face of the post that you measured from is said to be the “layout face”. All exterior surfaces of all members are layout faces.

If the bent girts are inconsistent in their width, make it flush to one side, and let the other side “float”. It may stick out slightly, or it may be slightly inset. The side you pick to be flush with the post will become the layout face.

On larger frames with more interior members, pick a direction and use that for all. Front to back (Bent 1 or Bent 3), and side to side (post one side or post 2 side). On gable bent girts, the outside is always the layout face.

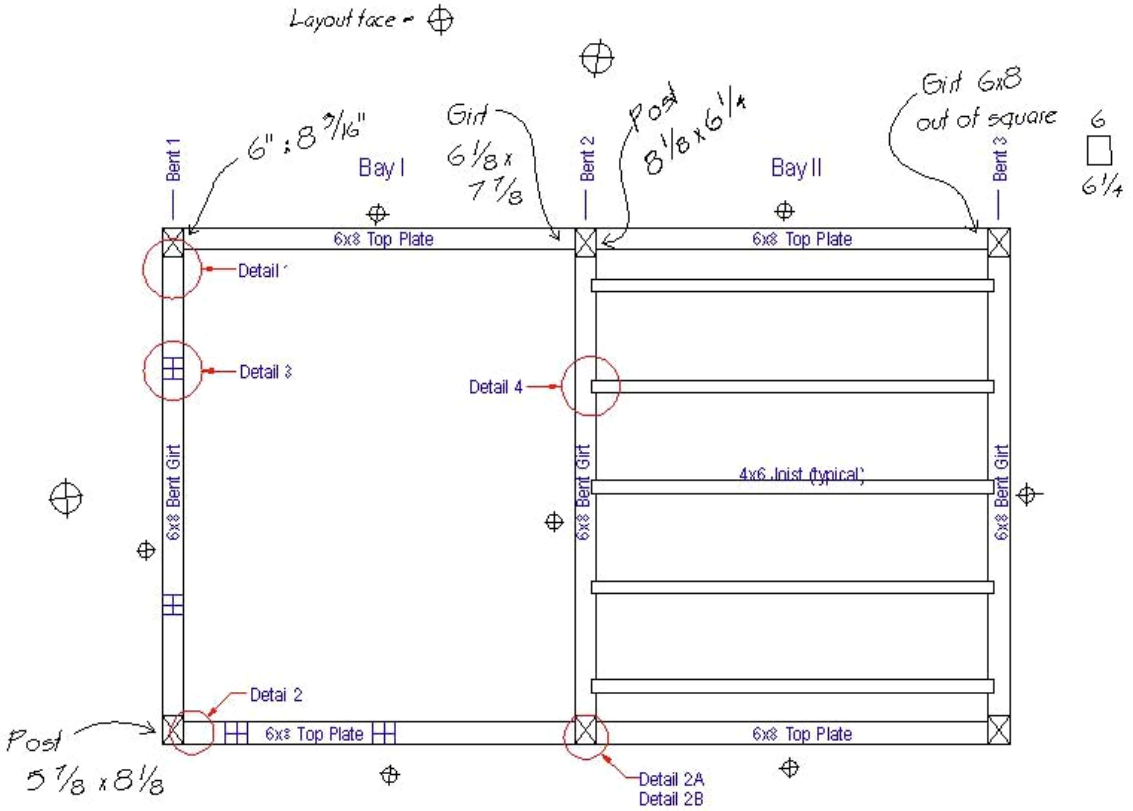

Diagram E – Mapping & Layout Faces

If the bent girts are inconsistent in their depths, you can solve the problem with either method.

Using the SQR method, we look at the depths of all the bent girts, and pick a common depth.

If the smallest depth is 7¾” , then I will use that as the default.

The end of each girt is “sized to 7¾”” . Make sure the sizing is done at least an inch before the post surface.

Using the mapping method, we simply record on the plan the depth of all bent girt ends and make the mortises accordingly.

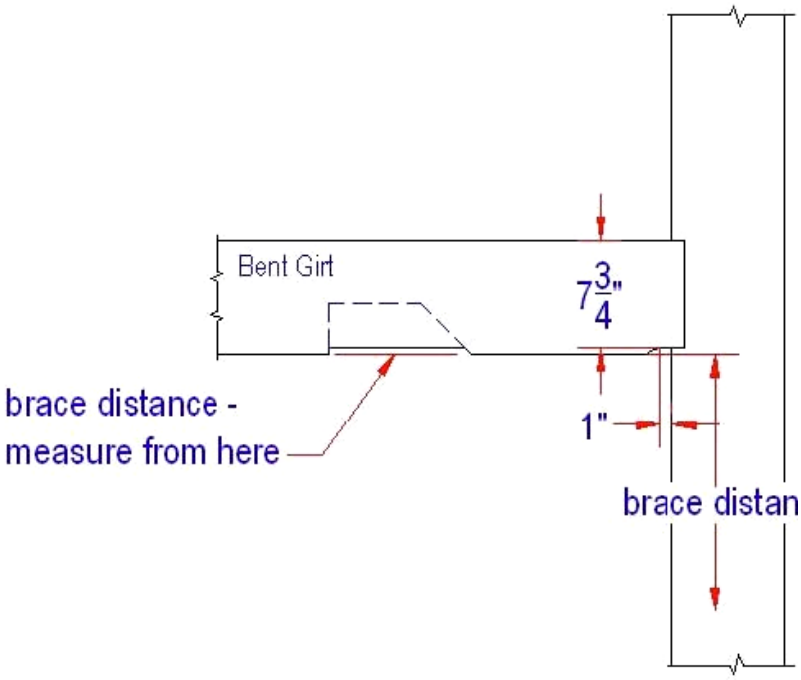

Diagram F – Square Rule & Mapping

Of course, the top of the bent girt is a constant height; in the case of my Ultimate Shed, the height is 7’4”. It is constant because it is the layout face of the bent girt.

Another example would be the top plate/post connection. If the plates are irregular in their 6” dimension, you can find the narrowest one, say 5 ¾” . Cut all the mortises 5 ¾” wide. Size the inside side of the top plates to 5 ¾”. The mapping method is easier – simply record the size of each plate end. Note, that with both methods, an out-of-square plate can be dealt with easily.

Now, go make some shavings.

Forrest Rand

Timberframe-HousePlans.com
ArlingtonTimberFrames.com