

Other Articles

A 9th-Century Pup Tent

Last summer we decided that our children had gotten too big to share one child's bed and our Pennsic tent too small to hold three beds plus anything else. The first step was to build Bill (four) his own bed. The second was to make a new tent for him and his sister Becca (seven).

We wanted a tent that would be period, would be less work to make and set up than our pavilion, and would have less timber to transport than the common Viking tents. A search of our library turned up a picture from an illustrated German psalter, c. 832, with "an host encamped against" the psalmist—a reasonably realistic and detailed line drawing showing a row of pup tents, seen from the side.



Note that: (1) there is a horizontal ridgepole supporting the top of the tent, visibly sticking out at both ends. We assume it is supported by two vertical poles. (2) The tent wall is trapezoidal, longer at the ground than at the top, so that the end stakes reach out ahead of the ends of the ridgepole. (3) No ropes are visible, although the picture is sufficiently detailed that you can count the stakes (7 on a side). (4) There are triangular doors at the ends (at least the front end) of the tent that can be thrown back outside the tent when open.

We wondered if the lack of supporting ropes to give front-back stability was real or merely artistic license, but decided to make it as drawn and add the ropes if we needed them. In fact, the tent stood through two thunderstorms without any serious problems; the shape of the walls, with cloth stretching forward and back to stakes from the vertical poles, gives stability enough. After Pennsic, we came across a webbed description of an Anglo-Saxon tent called a geteld; it was the same tent. Apparently the design was used over a substantial area.

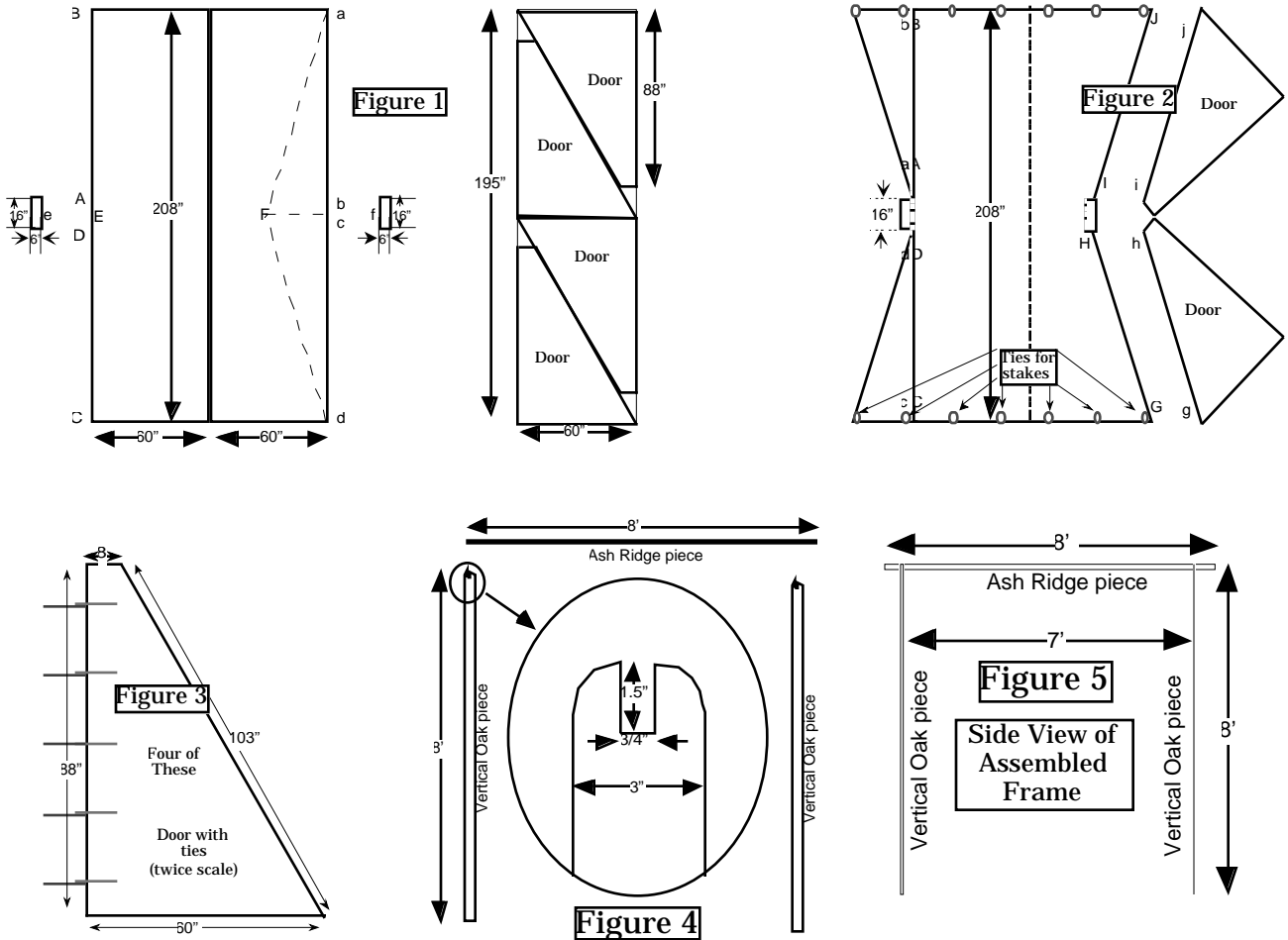


Our Tent
(Photograph by Stephen Bloch)

Size: we needed it big enough to take two small children's beds, one of them a four-poster, plus a little extra space. The tent as we made it is a narrow triangle 8' high at the ridgepole, with a rectangular footprint 12' long and 7' wide.

Materials

12 yards of 60" cotton canvas for the walls and another 6 yards for the doors
2 8' lengths of 3"x3/4" oak for the vertical poles. (If you don't have a source for long oak planks, ordinary 2x4's would work fine.)
1 8' length of 1 1/2"x3/4" ash for the ridgepole (a 2x4 would work for that too).
14 wooden stakes, 8" long



Construction

Figure 1 shows how the cloth is laid out and cut for the tent and doors; the two 6"x16" rectangles that go over the end of the ridgepole can be cut from any convenient scrap pieces. Figure 2 shows how the pieces go together; I have left out the second set of doors to simplify the drawing. Point A joins to point a, B to b, etc.

Figure 3 shows details of the door ties, Figure 4 shows the frame pieces and Figure 5 the assembled frame.

Reference

Swarzenski, Hanns, *Monuments of Romanesque Art: The Art of Church Treasures in North-Western Europe*, 2nd ed., University of Chicago Press, Chicago, 1967. The picture in question is Plate 4, Fig. 6.

Many years ago, Elizabeth and I tried to figure out, mostly from pictures, how medieval pavilions were constructed. We built three pavilions based on our design, starting with a six foot tall scale model intended for a child, then one we thought was big enough for us (and used for several Pennsics), and finally one that was big enough for us. We used it for quite a while, but were never entirely satisfied with the design.

About a year ago I made a new pavilion based on a design by Dafydd ap Gwystl—who had done a much more careful job than we did of trying to figure out how period pavilions were constructed. I like it so much that I have just replaced my article describing how to make our design with Dafydd's article describing how to make his. A longer version of his article, complete with pictures, evidence that many period pavilions were of about this design, a mathematical appendix describing how to calculate the dimensions for constructing a pavilion of arbitrary size, and much else, is webbed at: www.adelphi.edu/~sbloch/sca/tents/kuijt.article

Cariadoc

Making a Medieval Single-Pole Pavilion

By David Kuijt, aka Dafydd ap Gwystl

I will describe dimensions for three separate designs: a small tent suitable for a dayshade, changing tent, or one or two people; a larger multipurpose pavilion; and a large pavilion suitable for use as a great hall at events, sleeping a whole household, and so on. All of the dimensions I describe are calculated based upon finding 60" wide canvas. The bottom edges of the wall trapezoids, on all three designs, are exactly 60" across. If your canvas has different dimensions you may need to redesign. For example, if you have 96" wide canvas, it is possible to construct an 8-spoke pavilion with 6' spokes.

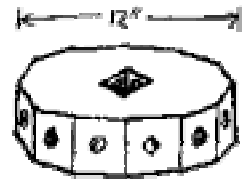
The small tent uses 8 spokes 4' long. It is 11' tall, 13' diameter on the ground (134 square feet area), and requires 32 yards of canvas to construct. The cost of this tent in materials is less than \$200, depending upon the price of canvas in your area.

The pavilion has 12 spokes 6' long. It is 13' tall, nearly 20' diameter on the ground (293 square feet area), and requires 54 yards of canvas to construct. This tent will cost around \$300 in materials by my estimate.

The large pavilion has 16 spokes 10' long. It is 17' tall, more than 25' diameter on the ground (516 square feet area), and requires 88 yards of canvas to construct. This large pavilion will cost less than \$500 in materials, depending upon the price of canvas.

HUB:

The easiest way to make the hub is to laminate four pieces of 3/4" plywood to make a slab 3" thick. Use good wood glue, and be sure to use high-quality plywood. The more laminations (layers) in the plywood the better. Once the glue has dried, cut it to shape (8 sided, 12 sided, or 16 sided depending upon the size of pavilion) and drill one hole in each side using a 1.5" spade bit. You only need to go about 2" deep on each hole.



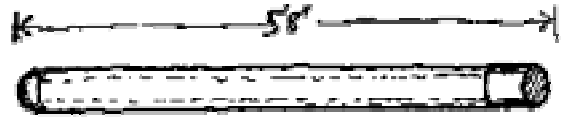
After the spoke holes are drilled, you need to make a hole through the center of the hub large enough to admit the center pole. The size and shape of this hole depend upon the dimensions of the center pole.

The dimensions of the hub are not crucial to the design of the pavilion. The important thing is that the hub is broad enough for the holes holding the ends of the spokes (8, 12, or 16 spokes in the three designs of pavilion I describe). In my pavilion the hub is 6" radius, and the holes for the twelve spokes are 2" deep. This means that the spokes should be 4" shorter than 6' (in other

words, 5'8") so the distance from the center pole to the end of the spokes is exactly 6'.

SPOKES:

Go to your lumberyard and buy one 2x4 for every two spokes needed. Pick dry 2x4s with no warp or knots. Rip the 2x4 into two 2x2s on a table saw. You can use them with square cross-section or make them more attractive by beveling the edges with a hand plane, joiner, router, or a tablesaw blade set at 45 degrees. Round one end down with a rasp or file so it has no sharp corners to abrade the tent. File the other end down to a 1.5" diameter cylinder, so it fits in the holes of the hub. The fit does not need to be precise. The twelve spokes on my pavilion cost less than \$10 total.



CENTER POLE:

The only important characteristics of the center pole are that it is strong enough, the right length, and that it fits in the hole in the hub.

The center poles in manuscript illustrations and paintings vary from moderately slim to enormously huge. If you have a car with a roof rack that can take a long pole, you might want to have a pole without any joint. If not, the following joint system is easy and reliable.

My center pole started out as a 7' piece of 8/4 Oak, about 6" wide. I got my fancy woodworking store (where I found the wood) to plane it and cut it into two 7' long poles, 2" square, and some waste. The total cost to me was \$25 or \$30.

I then bought a 16" section of 2" square metal pipe from a metalworking store. I cut two ends of the 7' poles at a 60 degree (steep) angle, then fitted one end tightly into the metal sleeve and the other one slightly more loosely.



Finally, I beveled the top section, rounded the top and drilled a hole into it, into which I glued a large metal spike. The result is a center pole that comes apart readily, and is quite sturdy.

FLOOR:

The slowest thing about putting this pavilion up is figuring out where the walls should be properly staked. Having a floor sized and shaped to match the base of the pavilion can vastly accelerate this process. This floor can then be laid out before the pavilion is put up, showing exactly where every stake goes. The floor should be made of some durable, waterproof, rot-resistant material that is easily cleaned. Since it is not attached to the rest of the tent it can be easily replaced or repaired if necessary.

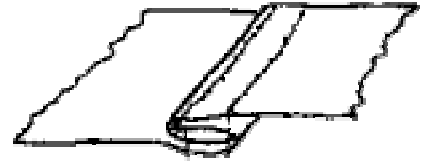
Sewing Notes

First, the caveat: I don't know much about sewing. There may be much better ways to do the stuff I describe below, and I'm sure that an experienced sewing guru would know the better ways to do it. If you want to ask such a person's advice, great. (And by the way, if you find some better way to do some of this stuff, please let me know). If you want to just muddle through, follow my instructions below.

Buy canvas that is pre-treated to be water-resistant and fire-retardant, if you can get it. Buy good canvas. This is not the place to cut corners of cost.

I STRONGLY advise that you not attempt to sew the pavilion without a very heavy-duty sewing machine. You can rent these in some places, or find a friend who has one if you are lucky. Some possibilities for renting or borrowing heavy-duty sewing machines are university theatre departments, theatrical supply stores, or commercial enterprises making or repairing sails or tents. Don't try to use an everyday utility sewing machine if you can avoid it. It will be very frustrating and take a long time, breaking a lot of needles. I'm speaking from experience, here.

Get some experienced sewing guru to advise you on any questions you have regarding the sewing. One important thing to do is to get them to show you how to make a flat-felled seam: all the seams on the pavilion should be flat-felled seams for strength. Luckily for anyone who (like me) is a sewing ignoramus, all the seams are straight and simple.



Cutting out the large canvas pieces can be a chore, especially marking the long straight lines. The easiest way to do this is to lay the fabric flat, then take a surveyors chalk-line and use that to mark the cutting line.

NOTE!!!! There are **NO SEAM ALLOWANCES** marked on the pattern. You **MUST** allow some appropriate seam allowance on the outside of each pie piece for the roof and of each trapezoid for the walls. I'm not exactly sure what seam allowance is best: I added a 1" seam allowance. If you forget to do this, you will waste an awful lot of fabric.

First, finish all the rain flaps on the edge of each roof pie piece. The rain flap is the 12" deep rectangle at the bottom of the pie piece. You can dag it if you wish, hem it or edge it with some contrasting colored edging.

Now sew all the pie pieces for the roof together. At the peak you will need to sew a large metal ring or grommet to the pieces. Alternatively you can take a short section of 1/2" rope (something that will not rot: nylon or hemp, not cotton) and wrap the thin ends of the pie pieces around the rope before sewing them down. This will leave a hole at the very peak of the roof for the center pole to go through.

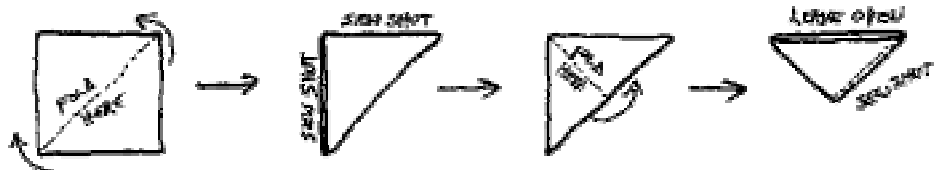
Finish the top edge of each wall trapezoid, and the mud flap at the bottom (the rectangle 5' long by 1' deep).

Now work your way around the tent, sewing one trapezoid on at a time. Note the dotted line on the pattern that marks the edge of the flap – that is where the top of the wall must be sewn to the roof. Make sure that the roof rain flap is on the outside. Sew the seam attaching one trapezoid to the other along the side seam as well as the roof seam.

Before you go too far, decide how many doors you want and where. To make a door, just finish the adjacent vertical edges of two wall trapezoids rather than sewing them together. I've found it very convenient to have two doors on opposite sides of my pavilion. This allows me to open both doors and let a breeze through in hot weather, and it is often convenient to have a back door.

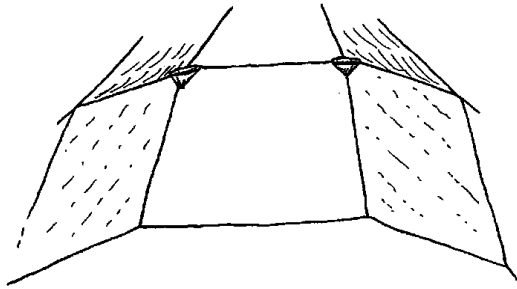
Once the walls and roof are sewn, you need to make small reinforced cups of some of the remaining scrap canvas. These cups are sewn to the edge of the eaves. Their function is simple—they lock one end of a spoke in the right position on the edge of the roof.

Take a square of canvas and fold to make a triangle. Sew it down and finish the edges

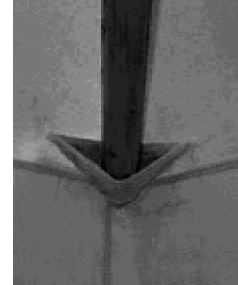


using any simple method (hem, serge, whatever). Fold again, to make another triangle. Sew one edge so that you have a triangular cup shape, with the hypotenuse open. This sounds complicated, although it is very easy to do; I hope this illustration will help explain it.

Now sew the cup down (making sure not to close the cup) so the end of the pole will fit inside the cup. Sew one such cup at every spoke position (where the horizontal seam at the eaves crosses a vertical seam down a pie piece and wall trapezoid).



If you want to have ropes on the tent, sew simple loops to the outside of the eaves to take the ropes.



Stake loops are constructed by sewing heavy-duty woven cotton straps to the bottom of each vertical seam on the walls. Make sure you sew them

down securely. You will need one loop for every vertical seam joining two wall trapezoids; doors will require one loop for each trapezoid edge at the door opening (two loops total).

Stakes

Get your local blacksmith to make you enough 15" or 18" stakes. For simple stakes it won't be very expensive, and you might as well have good stakes for a good pavilion. If you have no local blacksmith, get some 12" tent nails. Don't use aluminum or plastic stakes – they won't last, and they aren't good enough.

Painting and Decoration

Some pavilions were plain undecorated canvas, but many of the ones shown in manuscript illustrations are brightly colored or painted. I haven't experimented in dyeing canvas, so I can't give any useful advice for reproducing the beautiful full-color pavilions that can sometimes be found in illustrations. Consult with some local fabric guru and experiment.

Painting a pavilion is quite simple. Most pavilions were painted with simple lines, gothic arches, and the like. This turns out to be quite easy to do. I bought commercial exterior acrylic latex house paint from a local do-it-yourself store. You need to thin the paint with water so that it soaks into the canvas a bit. This makes it much easier to brush on in a single application – undiluted house paint tends to bead up on the surface. You must avoid diluting the paint too much, though, or it will wick out from the design rather than sticking to where you apply it. I found that thinning the paint with an equal amount of water gave me a good consistency. As an added benefit this also cuts the cost of the paint in half, as you get two gallons from every gallon you buy. Don't paint your pavilion indoors – find a big slab of clean concrete or pavement to lay the pavilion out and paint it. The paint will bleed through the canvas slightly, so don't paint on a surface where this will matter. Be very careful to avoid spills onto the canvas, as they are impossible to clean up.

Most single-pole pavilions seem to have had a decorative finial, often a golden ball. Some pavilions have whole statues on top. Flags are also fairly common, sometimes in conjunction with a gold ball. A decorative finial of some sort makes the pavilion look nicer, but it also has a practical purpose in plugging the only hole in the pavilion fabric, at the top. I've experimented with a number of simple ball designs but I haven't found one I'm really satisfied with yet.

Finally, the flap at the end of each roof segment is often decorated. They may be dagged or

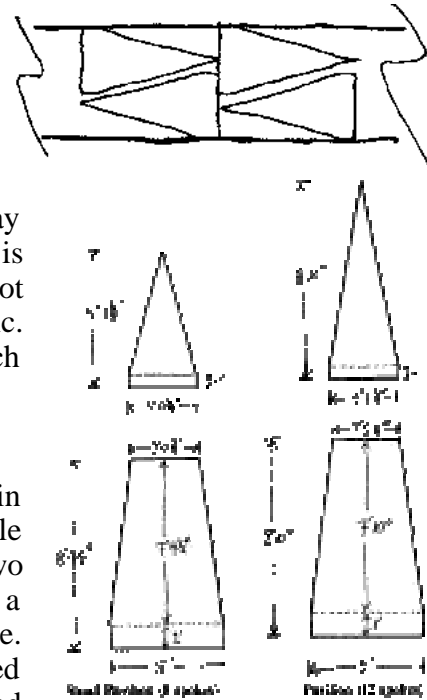
painted, sometimes with mottoes and sayings in contrasting colors to the tent.

Appendix A: Pavilion Plans Fabric and Layout

These patterns are based upon 60" wide canvas. The trapezoidal wall pieces take up the full width of the canvas, so can only be laid out in one direction. The most efficient way to lay out the triangular roof pie pieces is shown below. It is possible to lay them out so as to use less fabric, but not advisable, as it involves cutting along the bias of the fabric. Cutting along the bias will allow stretching of the piece, which will distort the pavilion in the long run.

Postscript

I'd like to thank Branwynn Ottersby, my squire and partner in chaos. She and I did all the sewing on the original single-pole pavilion, attempting with our blood and curses to prove that two people who had no skill at all with sewing could still make a pavilion. She also graciously consented to proofread this article. I'd also like to thank Sorcha de Glies, who tested the improved design described in this article, and proved with her blood and curses that having someone who actually can sew improves the whole product.



His Hub



Comments by Cariadoc

My version of Daffyd's design differs from his in several details:

1: My spokes are oak 1x1's rather than softwood 2x2's

2: I made the hub from a 2" thick piece of hardwood—it didn't have to be as thick, since the spokes are thinner.

3: My center pole is a hardwood 2x2. I used a spokeshave to convert the cross section from square to octagonal for the top half of the pole. Then I cut the hole in the hub so that it would fit the top half of the shaft but not the bottom half. That way the hub slides halfway down the centerpole and stops when it gets to the point where the pole is no longer shaved down.

4: My stakes are hardwood 1" dowels. Iron stakes, while not impossible, strike me as an unlikely extravagance in a society where iron was very expensive and wood very cheap.

5: My centerpole is a single piece of hardwood, 12' long (I'm shorter than Dafydd). I've spent too much time, mostly at the end of Pennsic, trying to convert a two piece center pole back into a one piece center pole.

My Hub

