

A Rustic Cedar Bench

Introduction:

While there are many small outdoor bench plans available, I have not seen one that describes how to use those 2" to 8" diameter cedar tree trunks or limbs you just have lying around. So here is my attempt to describe a "how to" plan. I have made two benches and this describes my second bench.

Some General Comments:

One of the things about this project is that we are **not using dimensional wood**. You might have 10" diameter logs for the legs or arms while I only had ones to about 8". You see 8" was about the limit I can easily cut with my handsaws when acquiring the trunks in the field. I have a small chain saw but it is electric.

The diameter of the logs used for specific purposes influences the lengths of other elements! Thus you must plan what logs are to be used for what purpose. I will indicate where diameter of one log influences the length used for other members. The other side of the coin here is this is NOT cabinetry work, it is rustic construction. For most parts a 1/2" or so is close enough. In my opinion the only areas where reasonable uniformity is needed is the alignment of the slats for the seat bottom and back. If some slats are say a 1/4" different in height that's OK. But a difference of say 1/2" may be felt when you sit on the finished bench. The other area is at the front seat bottom brace, where the seat slats meet the brace. This should also be fairly even. Beyond these two areas, I didn't worry about a 1/4" or a 1/2".

Basic Dimensions:

The basic dimensions that we aim for are those for a comfortable chair:

- A level arm at a height of about 26", at the top.
- A seat height of about 16" at the front and a slight slant down to about 15" at the point where the seat back meets the seat bottom.
- A seat back that slants slightly back. [My benches have a 2" slant back on a 16" rise.]
- A seat depth of about 16".

The basic dimensions for a comfortable bench for two individuals:

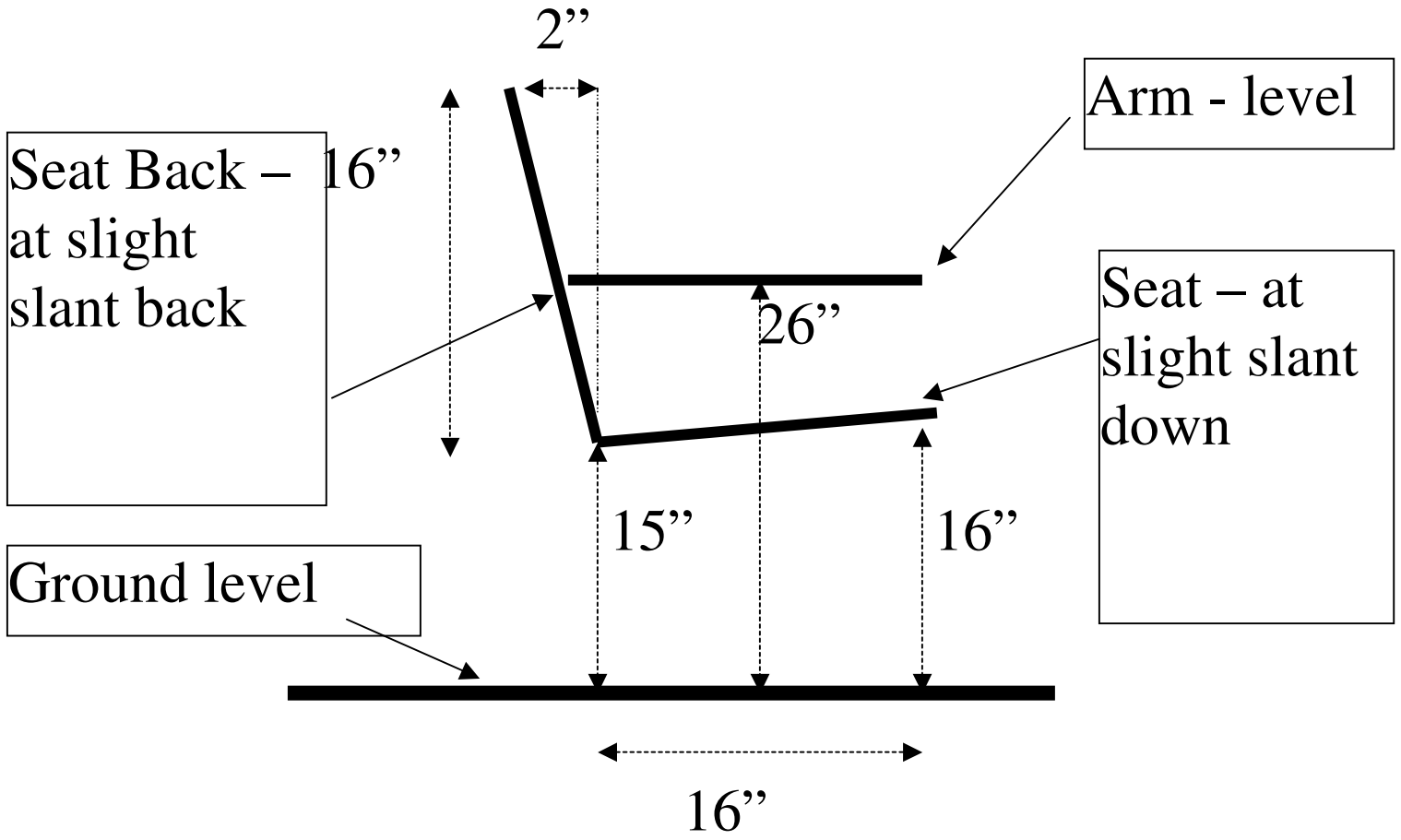
- The seat width, between the inside of the arms, is about 44".

Finally, for a little character, the seat back slants vary in height:

- The slats on the outside start at 16" and gradually increase to 21" in length at the center.

The picture on the next page tries to show the critical dimension all in one diagram.

General Chair Proportions



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Description of photos at the end of this document:

- 11 photos of the actual rustic bench showing details as only a picture can.
 - Arm-Top-Detail
 - Back-Leg-Detail-General-Lower-View
 - Back-Leg-Detail-General-Top-View
 - Back-Leg-Left-Detail-from-Back
 - Back-Leg-Right-Detail-from-Back.
 - Bench-Full-Sideview
 - Front-Leg-Detail-Frontview
 - Front-Leg-Detail-Sideview.
 - Seat-Back-Detail.
 - Seat-Bottom-at-Front-Detail.
 - rustic-cedar-bench2.jpg (original of the reduced image shown on my web site)Except for the last in the list, these photos will be referenced in this document.

- 1 photo of my first bench in our local cemetery.
 - Original Bench UpClose

Now on to the details about making a Rustic Bench!**Assembly Suggestions:**

These suggestions are not intended to cover every minute detail but to address the major assembly steps. **Please read all the steps through at least once before cutting any wood!**

Since your wood might be of different diameters from what I used, the general principle is to come as close as possible to the dimensions in the Figure on page 2.

Bench Parts Overview:**Wood:**

- 4 legs, length related to arm thickness. Usually the thickest pieces.
- 2 arm pieces, approximately 19" plus diameter of back legs.

- 2 lower arm braces. Same length as arms. Should be at least 3" diameter but don't need to be as thick as legs or arms.
- 4 braces that run the width of the bench:
 - Front seat bottom brace 44" plus the diameters of the two front legs. Should be at least 3" in diameter.
 - Back seat bottom brace 44" plus the two tenon lengths (about 48" total). Should be at least 3" in diameter.
 - Upper seat back brace 44" plus the diameters of the two back legs. At least 3" in diameter and should be the thickest brace.
 - Lower seat back brace same length as Upper one. Can be a smaller diameter than the upper seat back brace, but at least 2" in diameter.

The seat back and seat bottom slats are whatever diameter wood you can split. I try to stay in the 2 to 2 1/2" range but that is because of the circular saw available for splitting them.

The approximate amount of tree trunks or limbs, for a small bench with a seating area that is comfortable for two, (44" wide) is:

- About 20 foot of 6" to 8" diameter logs for legs, arms and side braces.
- About 20 foot of 3" diameter for the seat and back cross supports, there are 4.
- About 30 foot of 2 to 2.5" diameter to be split in half for the seat and back pieces.

Hardware:

All the main members are secured using zinc plated lug screws and washers. I use washers so that the screw head will not sink or pull into the wood. The lengths needed depend on the wood diameters you use and the specific spot. In general I tried to get at least 3" into the member the screw actually attaches too. For my bench the longest screw was needed at the top of the back legs as this one goes through the upper seat back brace, the back of the arm and attaches into the top of the back leg. All other screws just attach two members.

I tried to use 1/4" plated screws when possible. But the longest length 1/4" screw I could find was 6". Going to 5/16" increases the cost by about a factor of 2. In addition, many stores don't carry 5/16" diameter plated screws. If you go to 3/8" the cost really increases. For the 14 screws and washes I needed the cost was \$16. All were 1/4" except the upper back arm ones which was 5/16".

For the seat bottom and seat back slats I used 2" or 2 1/2" coated deck screws. These are fairly inexpensive.

Total hardware cost was under \$20.

Interrelationships of lengths and wood diameters.

- A. The thickness of **arm pieces** relates to the length needed for the **legs**. This can be made even a little more difficult if the diameter of the arm piece varies more than ½” from back to front. I made the front arm notch and the back lower arm notch about one quarter of the way through the log. Having done this, the length of the leg pieces is then set at 26” minus the remaining thickness of the arm piece. The length of these notches, along the arm’s total length, are related to the thickness of the leg pieces. The upper back arm piece notches are related to the diameter of the upper back brace.
- B. The **length of the arm** pieces is related to the diameter of the back leg pieces. This comes into play in that a thicker back leg will result in the arm having to go further behind the seat back. The arms lengths are 19” plus the thickness of the back leg. If the two back legs differ in diameter then the arms will be different lengths. The back of the arm is notched under this upper seat back brace.
- C. Finally, the length of the three braces:
- Seat Bottom front brace,
 - Seat Bottom back brace,
 - Seat Back upper brace,
- Are related to the leg diameters. The desired seating length is 44”, the distance between the inner side of the front and back legs. Since these three braces are notched on to the legs their total length is a function of the leg diameters.
- D. The forth brace, the Seat Back lower brace, is fixed at the two times the tenon length plus the width of the seat.

Details about the order and cutting of parts for the bench:

I do not embed the photos in this document as doing so MS expands the Word file to about 6 Megs. Print and read this document, viewing the photos are they are referenced.

1. First select the general pieces of trunk you will use for the legs. One suggestion is to mark off the areas you plan to use for the front and back legs but don’t cut yet. Measure the approximate diameter of each leg at the end that will be the top of the leg.
2. With the leg top diameters known you can now cut the arm pieces. The bottom notches on each arm piece should be the diameter of the top of the leg it will mate with. The length of an arm is 19” plus the diameter of its back leg. If the back legs are different diameters then the arms will be different total lengths. Don’t cut the upper notch at the back of each arm yet.

Look at the three photos: Arm-Top-Detail , Front-Leg-Detail-FrontView. and Bench-Full-SideView to get a feel for the arms and legs.

3. With the lower arm notches cut, you can now determine the exact length to cut each leg piece. Since the top of the arm should be level and 26" high, measure the thickness of the arm at each notched spot and subtract from 26" to get the desired leg length.
4. The lower leg braces could also be cut now. The length is 19" plus the back leg diameter at the position you will install it. I set this at about 3" off the ground, at the bottom of the brace. You could also cut the lower notch in the front and back legs at this point. They depend on the diameter of the lower leg brace. They are cut into the surface that will be on the outside of the leg.

Look at the two photos: Back-Leg-Detail-General-Lower and Lower-Leg-Detail-FrontView (at the bottom) to get a feel for the lower leg braces.

5. The front seat brace can now be done. Its length is 44" plus the diameter of the front legs. I made this even a little longer, to have some length past the leg. The hard part here is to cut out a groove the full length of the brace. This groove supports the front of the seat bottom slats.

Technique Note:

If my method to cut a groove from a log appears too complex or dangerous, You could consider placing the seat bottom slats on top of the two seat braces. The seat braces will then need to be lower to get the 16" height desired. Also the seat slats will extend further out the back of the bench. This will require longer seat slats and not look quite as compact as this design. However, I cannot vouch for the safety of my technique. I still have all my fingers but did this step with caution, and **as always** safety goggles!

I cut a segment about 1" by 1" from the brace with my circular saw. My technique for cutting is as follows:

- Select a level piece of ground where there are no stones etc. in the dirt
- Try to find a line along the desired cedar trunk, which is flat. With all the many little branch ends this is sometimes difficult to do and may require going over a length with a chisel to remove the small dimples the branch points leave.
- Mark the line with a carpenters pencil so you can see it as the cut proceeds.
- Using small side stakes, firmly hold the length cedar trunk to be cut securely to the ground.
- Set the depth of the circular saw to the desired cut depth, no deeper.
- Check that the wire is free and will not bind on anything as you move it along the length of the branch.
- Start the saw a little off the end but with the front of the plate on the branch. Slowly bring the saw into contact with the wood. Try to move forward at a steady pace. I did this with one knee on the ground in a slight crouch.
- Some of the cedar knots yield really tough wood and can bind the saw some.
- Rotate the trunk 90 degrees and make another cut along the length. A chisel may be needed to break the segment away from the rest of the log.

After the groove is cut, the ends of the front seat brace can be notched to mate with the front legs.

See the photo [Front-Leg-Detail-Sideview](#) for a look at the groove.

6. Now you can cut the notches in the front side of the front legs. The top of the front seat brace should be 16" off the ground. Thus with the diameter of this brace known, you can determine where to make the cut. This brace is to be level, so if the front seat brace differs in diameter from one end to the other, the thin side will require a higher notch on the appropriate front leg. You want the top of the brace to be at the same height across the whole front of the bench. This notch finishes the front legs except for smoothing the arm front.
7. Select the seat back upper brace. It is 44" plus the diameter of the two back legs. This brace fits over the back of the arms. So with the brace selected, you can now put the notch into the upper part of the arms. The notch length needs to match the back upper brace diameter. And the notch in the brace also matches the arms diameter (not necessarily the same as the back legs.)

See the photos: [Back-Leg-Right-Detail-from-Back](#) and [Back-Leg-Detail-General-Top-View](#) for a feel on the seat back upper brace.

8. The seat bottom back brace is next. The length should be 44" plus 4 to 5" for the tenons. First cut a groove similar to that done in the seat bottom front brace, see step 5. Then you need to turn the ends into circular tenons. I make a tenon mortise set by using two hole saws that are 1/8" different in diameter. The tenon is made with the larger diameter hole saw. In the case of this bench 2 1/4". To get a maximum depth I recessed the center hole about 1/2" with a 3/4" forstner bit. This gets about an extra 1/4" depth, see the threaded interior of the hole saw. After cutting to the maximum depth possible, I trimmed off the wood outside the cut with some saw cuts and chisel effort. What you are left with is a 2 1/8" diameter tenon about 2" deep.
9. Now you can make the mortise cut into the back legs. You want the top of the seat slats to be 15" from the ground (1" lower than the front). You know the diameter of the back seat brace. Thus the center of the mortise hole can be determined, 15" minus half the diameter. If a 2 1/4" hole saw was used for the tenon, then drill the mortise hole with a 2 1/8" diameter hole saw. Again use the same technique of a shallow 3/4" forstner bit hole to get a maximum depth cut. In fact you can increase the hole depth if you can chisel out some of the central wood when the cut is about 1" deep. The hole must be chiseled out after the cut is done. PS The seat back brace could be attached as a notched brace on the back of the back legs. However, this results in the seat bottom going way past the seat back, which looks a little funny to me. It also requires the each seat bottom slats to be 3 to 4" longer.

See the photos: [Back-Leg-Left-Detail-from-Back](#) (you can see the brace going into the mortise) and [Back-Leg-Right-Detail-from-Back](#).

10. **Finally, Assembly Step One:** It is time to assemble the arms and legs into units. When drilling the bolt holes, first determine the position desired and then drill a ½” deep forstner bit hole so that the screw hex head and washer will be below the surface. The diameter of this recess depends on the washed size, so test. Then drill the hole the rest of the way through for the appropriate screw size. The holes needed are:

- Lower side brace holes, one at each end.
- Arms, one at each end [**Note:** The back arm hole does not need a recess as the upper seat brace will be above it.]

I dry assembled each notch, hand inserted the screw and tapped the center position into the legs. Then drilled a tap hole appropriate for the screw. Without a tap hole it would be very difficult to insert the screws. Also excessive force can result in any screw breaking off or splitting the wood. Finally, attach the leg lower brace and the arm to the appropriate two legs. Don't fully tighten the screws yet. The top back screw should be just put in a few turns for now.

See photo Bench-Full-SideView

11. **Assembly Step Two:** With the arm / leg assemblies ready, you can now add the front seat brace, the back seat brace and the upper seat back brace. The holes needed are:

- Front seat brace holes, one at each end
- Upper Seat back brace holes, one at each end (remember this notch goes over the arm back)
- A hole from the outer side of the back legs positioned so that it is centered on the mortise. This hole is recessed and will be used to secure the tenon end of the back seat brace.

Again use a rough dry assembly to get a tap point into the member to accept the screw followed by tapping a hole to accept the screw. I assembled the front seat brace first, only partial screw insertion. Next slip the seat back brace tenons into their mortise holes. Finally I placed the upper seat back brace into place. The last screws to be inserted are those that secure the back seat tenons. With all loosely attached, check for square ness, adjust as needed and tighten all screws. All the main members, except the lower seat back brace, are now attached.

12. If my method to split logs for the seat and back slats appears too complex or dangerous, commercial Western Cedar boards could be used. I cannot vouch for the safety of my technique and suggest that if you are not comfortable with this approach to use commercially available Western Cedar for the slats.

Split whatever amount of wood you think you will need for the seat bottom and back slats. I used the same technique as in Step 5. Depending on how close you can get to splitting the wood, I needed to use my manual plane and then belt sander. This is the real grunt work.

13. The seat bottom slats are installed first. Depending on the wood thickness some small notches may be needed to get the slat flush to the front seat brace top. Exact height at the back is not too important. The last 4” of the bottom slats will be behind the seat back slats. I used one screw front and back on each slat.

See the photos [Seat-Bottom-at-Front-Detail](#) and [Back-leg-Right-Detail-from-Back](#) (where you can just see the back screws).

14. With the seat bottom in, the last large piece can be installed. The seat back lower brace is positioned against the back legs resting on the seat bottom slats. It is notched on both sides, based on the back leg diameter at the position it meets at. The back legs will need a notch too. Put a hole in each end of the seat back brace with a recessed hole for the washer. After all the notches have been made, do a dry run placing a few back slats in place to check their slant. You might need to make the brace notch a little deeper to reduce the slant. When you think the slant is OK, attach the seat back lower brace.

See photos [Back-Leg-Left-Detail-from-Back](#) and [Back-Leg-Right-Detail-from-Back](#).

15. Now attach the seat back slats. Again I used one screw at each end. The bottom screws are all at the same position, height wise. The upper screws will be positioned depending on the upper seat back brace but usually form a line.

See photo [Seat-Back-Detail](#).

16. Finally, I rounded the arm ends and some of the brace ends to give a more finished look and to have smooth surfaces for your hands to move against.

See photo [rustic-cedar-bench2.jpg](#) for the finished product.

Hope this is a help to someone build a beautiful rustic bench.

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 - [Front-Leg-Detail-Sideview](#).
 - [Seat-Back-Detail](#).
 - [Seat-Bottom-at-Front-Detail](#).
 - [Rustic-cedar-bench2.jpg](#)

Arm Top Detail



Back Leg Left Detail from Back



Back Leg Detail General Lower View



Back Leg Right Detail from Back



Back Leg Detail General Top View



Bench Full Sideview



Front Leg Detail Frontview



Seat Bottom at Front Detail



Front leg Detail Sideview



Rustic Cedar Bench



Seat Back Detail



Original Bench Closeup

