Bench Tops

Most all modern bench tops are built of concrete. There are several ranges which have tops made of wood; I discourage using wood in new construction unless it is the only choice.

Wood tops are typically nailed or screwed together and eventually rot and loosen, causing instability problems. The wood top surface is good to set your front rest feet onto (it's only good point). But the negative aspects of constructing a bench top out of wood outweigh the only good point. Wood tops typically cost more in materials and labor, need ongoing maintenance, become rotten and are flammable.

Concrete bench tops require forming, but after the forms are made you will be able to make multiple tops from each form. Concrete will stand the test of time better than wood and will add stability just by its sheer weight. The tops at my home range weigh approximately 550 pounds.

Shape

After choosing what material to use, the shape must be considered before the construction can start. Concrete allows the use of more shapes than could be easily built from wood. Concrete can very easily be formed into curved shapes. Top shape is one area I highly recommend you "Do Not Reinvent the Wheel".

After more than 50 years of formal Benchrest shooting, three slightly different bench types have survived. The most popular bench design is the T shape, then the benches with the tapered sides (toughest to use), and finally the horseshoe shaped.

There are a few ranges which use the horseshoe style of bench. Horseshoe shaped benches are more fragile to handle and require a more elaborate pedestal. The horseshoe style can cause problems when shooting the rail guns by crowding the center. The horseshoe benches cause problems when using many of the common dual port actions on the market today. When using a dual port action you have virtually no bench to eject the cases onto. One final point, larger shooters can have trouble getting into the cutout.

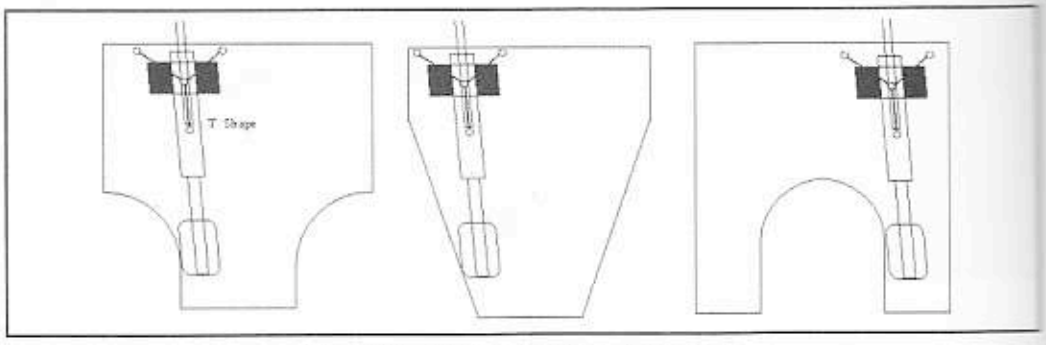

Figure 2. Different bench top design.

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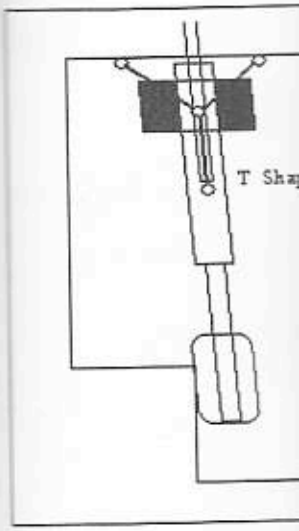


Figure 3. T

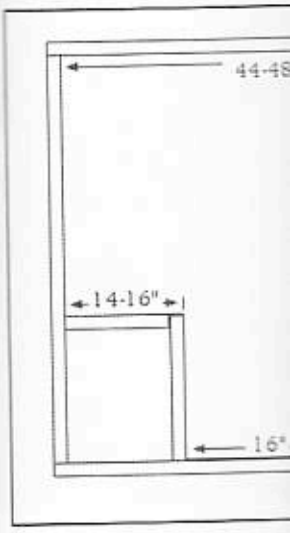


Figure 4. Form i

The middle bench in figure 2 is the style used at Kelbly's Range in Ohio, where the Super Shoot is held, and at the Benchrest Rifle Club of St. Louis. DO NOT copy this style of bench. Many current bench guns have the loading port on the same side the shooter sits. Forgive my drawing, but you can see the shooter's side of the bench is very small. Often, there is less room than shown in my drawing. You literally have little to no room for your loading block or loaded rounds on the shooter side of the bench.

Okie Shooters northeast of Oklahoma City, OK, and Midland, TX, use the following true "T" shape. With this style of bench there is plenty of room on both sides of the rifle. Another good quality of the true T type shape is the ease to build the concrete forms.

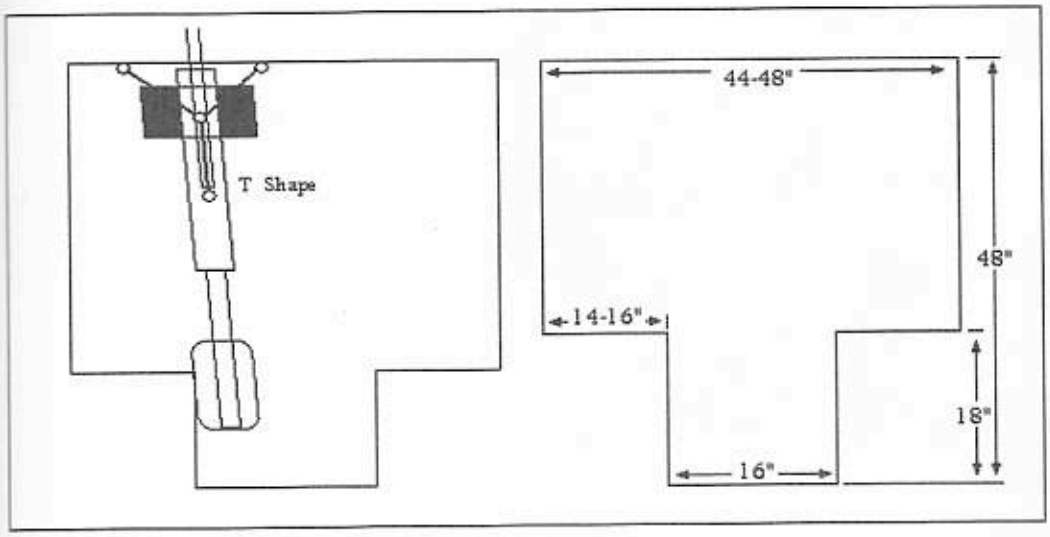


Figure 3. Top style used at Okie Shooters and Midland, TX.

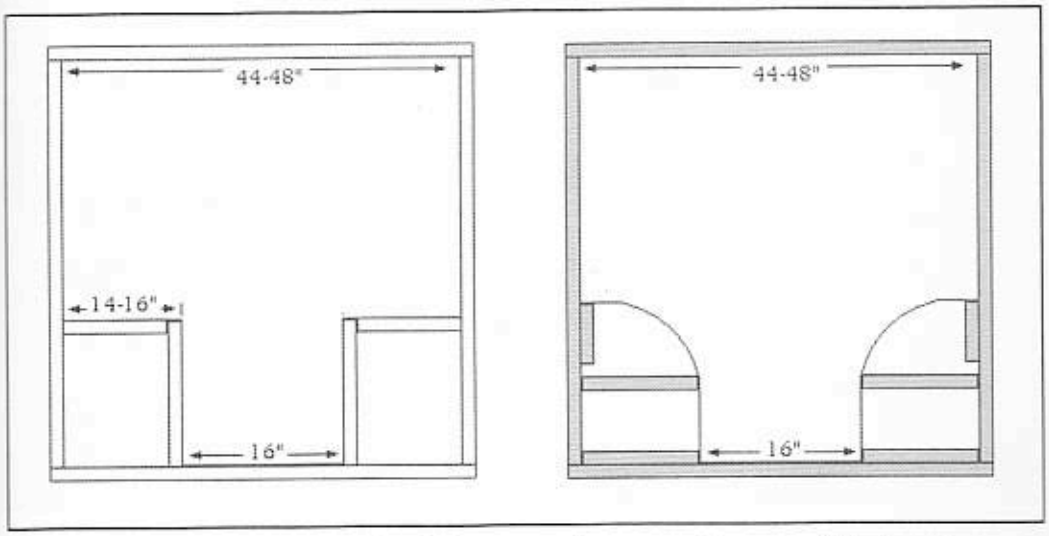
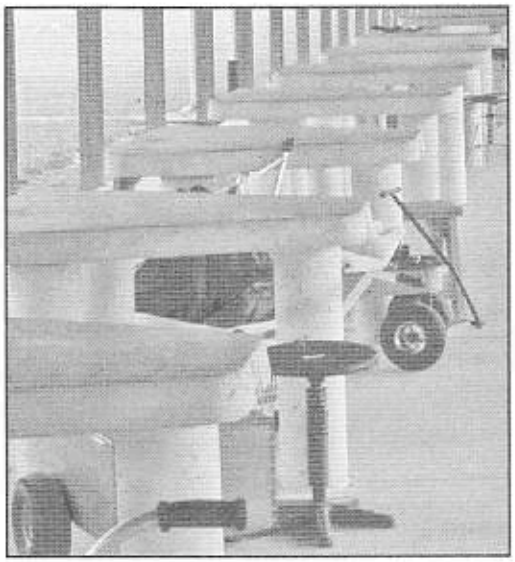


Figure 4. Form ideas using 2x4 construction, curve is made of tile board.

Where to Pour Tops

If human power will be used to lift the bench tops onto the pedestals save yourself some work. Pour the bench tops directly behind the pedestal on which they will ultimately rest as shown in figure 5. I first poured the tops for Mooreland, OK. too far away from the pedestals, we had to lift them up and place them on the back of a truck then lift again to place onto the pedestal. Hey, if you're using a tractor or lifting device, this will not apply.

Figure 5. Pedestals made of concrete blocks. Mooreland, OK.



St. Louis, MO.

Raton, NM.

Figure 6. St. Louis pedestals make of concrete formed in Sonotube.

Figure 7. Tops p

Pedestal

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Figure 7. Tops poured behind the pedestals on which they will rest.

Pedestal

The purpose of the Pedestal is to hold the bench top, hopefully without moving when the shooter leans against the side. Bench height is important and the top of the bench should be at a height of 32 inches. This is 3.5 concrete blocks high plus the mortar joints. When omitting the mortar, the height will be 4 blocks tall. Most shooters have adjustable chairs, shorter folks are used to having their chair a bit higher. Taller shooters are used to having their chair a bit shorter. Make your bench the standard height and you'll be comfortable most everywhere. One good "bad example" of bench height is Raton, NM. The tops are too high. The average height shooter, after setting their chair height, will have trouble reaching the ground.

After going through all of the trouble to make a good bench top it wouldn't make sense to put it onto a pedestal that moves. Two basic types of pedestals have become standard, one is the concrete block pedestal and the second is to make the legs from columns of concrete poured inside a cardboard tube called a Sonotube. Both can make a stable end product.

Common bench spacing is 6 foot center to center; 5'6" (Super Shoot) center to center is ok when trying to get the most benches for your firing line. Raton, New Mexico has benches which are 8 feet center to center. Raton's benches are too far apart. There are 75 benches at Raton. This makes the firing line 200 yards long. It's not much fun rotating benches at major tournaments, moving equipment from bench to bench. Raton could have 100 benches in the same firing line length if they would have used 6 foot spacing. Raton also has converging targets, five on one 12 foot frame, which leaves a rather large open space between the frames with no flags. You can see, sometimes more is not better, it's just MORE.

The numbers painted on the front of the benches, as seen in figure 1, are to aid when setting flags. When you get farther down range, it can be difficult to see what you are looking, for especially when they are in the shade.

Sonotube

Most lumber yards sell the hollow cardboard concrete forms called sonotube. They take a bit more time to layout where the holes will be drilled, but require less overall construction labor. After digging the holes, you build a frame to hold the tubes at the correct spacing, cut them to the correct height and install your stabilizing frame, fill with rebar, then concrete, and remove tubes after the concrete dries.

When filled with concrete, the block "T" shaped pedestal is the most stable. But this pedestal is more labor intensive and harder to build, requiring special block cutting tools, block laying skill, and is more expensive. The decision to build the "T" shaped pedestals at the Mooreland Public Range was easy. I felt, since this was a Public Park, and open all year to the public, it was necessary to build the most indestructible pedestal possible. After building the pedestals, I poured them full of concrete to tie them together.

Several years later I would come to realize how good my decision really was. First, there was bit of vandalism. Some friendly visitors felt it would be nice to relocate several of the bench tops to the ground. I am certain if the pedestals were hollow they would have also been destroyed.

I had a front seat to witness a shooter lose control of his vehicle. I just happened to be looking at the right place at the right time to see a car drive onto the firing line and strike a pedestal dead center. The pedestal stopped the car dead in its tracks. There was no damage to the pedestal or bench top. The car was not so lucky. As it turned out, the vehicle's neutral safety switch had been bypassed. This allowed the car to be started while in gear. The shooter had been interrupted when arriving at the range and not put the vehicle in park (range is flat as a pool table). The shooter reached into the window and started the car. The car took off, driving up onto the firing line. What a sight.

Angled Pedestal

If you will be shooting up-hill or down-hill, consider building your tops at an angle. Level the tops from side to side but with the range from back to front. Now you're thinking, "what the heck for," shouldn't it be level? Ranges where we shoot up or down hill with level benches can get you into trouble with your front rest being too tall or short, rear bag too tall or short. By angling the bench top front to back with the range, your equipment heights will be just as shooting on a level range, think about it. At my favorite range, Okie Shooters, we shoot down to 100 yards and up to 200 yards. Of course you take the middle ground and make the benches level in this situation. At Okie Shooters, the front rest is all of the way down shooting 100 and is way up when shooting 200. Just some food for thought, against the grain.

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Steel is flexible. Hollow
their movement.

Firing Line

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Pipe or wood pillars can also be used to support your bench top; wood has the obvious drawbacks when in contact with the ground, it WILL NOT stand the test of time. When using wood, you have done all the required work by locating and digging the holes. Find another area to save money.

Steel is flexible. Hollow steel legs should be filled with concrete to help dampen their movement.

Firing Line

The following picture is of the Benchrest Rifle Club of St. Louis and is one of the most luxurious and roomy in the United States. Most firing lines have less room to move equipment and provide less shelter during rain storms. You can see from the picture there is plenty of room behind the benches AND in front to move equipment when rotating benches.

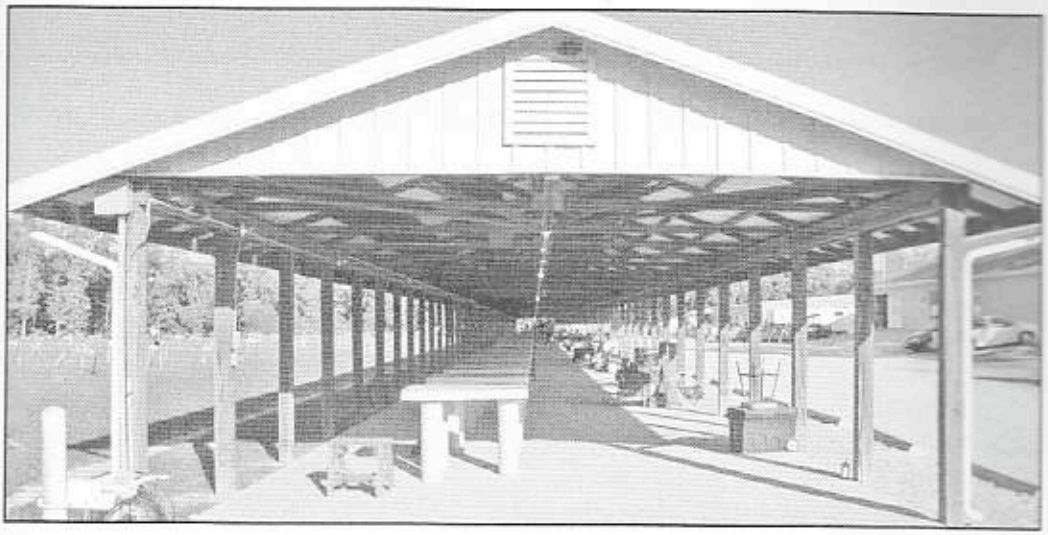

Figure 8. St. Louis firing line.

In figure 8 you can see how the shooter when seated at the bench will be centered under the roof. The roof is low enough to protect the shooters from about any driving rain. This picture was taken at the 2005 NBRSA Nationals. You can clearly see the sidewalk in front of the benches. There is also plenty of room behind the benches for the equipment while still leaving the walkway free of obstructions. Most ranges are not so well protected.

At many of the smaller ranges you will have a small place to load right behind the benches on 2x 12 boards between some of the roof supports. This gives shooters a chance to load right behind their bench. Figure 9 shows a portion of the Mooreland Public Range and shows the 2 x 12's between for reloading at the smaller local tournaments. I would estimate 20-25% of shooters load behind their bench.

Figure 9.
Mooreland firing line, tops poured behind pedestals where they go and loading boards

This light will not stop s

What materials are used to construct your awning or roof over the firing line should be considered carefully. Every side of this structure will be exposed to the elements and, if in a high humidity environment, you should carefully consider using steel uprights, roof trusses, and a metal roof. Treated lumber has a finite life expectancy. You should expect to replace wooden truss construction about every thirty years. Initial installation costs are lower, but wood will most certainly be more expensive in the long run. Somewhere toward the middle of the firing line should be a range officer's station. During NBRSA group tournaments you will have moving backers that might be controlled from the range officers position in the middle of the firing line. Also, the public address or PA system will be needed at the range officer's station regardless of the type of tournament.

Down Range Warning Systems

There are a couple of ranges which have down range warning systems. Caution is the name of the game when shooting on one of these ranges, especially during open practice sessions. During practice sessions before tournaments you will have many shooters visiting for the tournament. They will not be familiar with the system and are likely to go down range without first activating them. The trouble arises when a club member happens to the range while a visitor is downrange without activating the warning system. Club members might assume no-one is downrange because the warning system is inactive, and will sit down and shoot. These range gadgets have no idea if someone is downrange or not, they simple alarm or light when they are turned on. Be careful, look down range before shooting.

Figure 9B.
This roof is for looks only!