



## R&S Fence and Railing Supply

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# How We Install

Pool fence must be installed in compliance with local codes. The BOCA pool barrier code serves as the model upon which virtually every state bases their minimum standard. Local jurisdictions can and do impose additional imperatives. Check with your local building inspector.

It is best to have a layout of the installation using stationary objects such as pool or pavement edges, the filter or house as reference points. This is something we do when we measure to compile a material list. At the same time we check for the location of buried wires and locate water lines to and from the filter. The grade is also observed to determine the need for 'double punched' sections which allow greater 'racking'.

Using our layout, we determine the location of the first side of the enclosure. We then place a stake/pin at either end of the proposed fence line but beyond where the corners/ends will be. Starting at a stationary object such as the house or cabana makes the set up a bit easier. When the installation will be of the "isolation" type, we determine the location of our first intersecting line and set stakes/pins as previously described. From this point we will work backwards.

We run a string line from stake to stake (end to end) a few inches above the ground and as taut as possible. Working away from the structure or from the first intersecting line we begin marking the location of posts (as described below) until we come to the next corner or a gate. If a cut must be made, the finished job is always more appealing if you plan for it. Measuring for and planning cuts will be explained a little further on.



Ideally, a corner is located at the end of a full section. When we set up the corner, we allow for the fact that nails are set at 'centers'. It is best to use 2 stakes at each corner and place them far enough away from the location of the hole so they will not interfere with the positioning of digging equipment or wheelbarrows. We try not to move them once they have been properly placed. However, we are able to adjust the string to the edge of the corner post when it's time to set the perpendicular 'run'. We continue to mark

post centers as we work our way around the enclosure keeping in mind that it is much easier to move nails now than to pull a post later.



Post spacing is measured from center of post to center of post. The correct center to center measurement for OnGuard residential grade pool code fence is 72-1/2 inches and this varies from brand to brand. If there is no building to work from, we start at the location of a gate post or an end/corner. We locate the holes along the string line using a nail to designate the center remembering that we are marking the center of the post and taking that into account when placing our first nail.

As we place each nail we give it a shot of paint to make it easier to find after we've located all the post centers on each 'run'.



When we are going to use a machine to dig the holes, a large X will help us get back on track if we hit rock and the bit 'wanders'. A small mark will be obliterated as soon as we start to dig. The line that is painted parallel to the string should be 1 inch away from it

with the right angle line as square as possible. After the holes are marked, we remove the string so it is not a tripping hazard, get wrapped up in an auger bit or broken by digging tools. A 6 or 8 inch wide hole is sufficient. We go 10 inches wide to leave us room for adjustment if needed.



Our machine has side to side as well as front to rear movement of the auger power head. This will help us to get 'around' any large rocks to dislodge them and then return to the correct 'center'.



Holes are 'cleaned out' to remove any loose dirt. The string line is reattached as taut as possible; then we check to be sure the holes are located correctly in relation to it. The center of the hole should be approx. one inch off the string - just the way it was marked. The idea is to have an equal amount of cement on all 4 sides of the post. Next, we try to establish a height to set our string at. A transit or other leveling device is useful for runs over long distances that are not close to reference elevations such as a

patio.

If we're following the pool deck we can use a level at either end and tap the pins down till we reach the right height with the string. Only **two inches** is allowed between the

bottom rail and the finished grade. The string now gives us a point to build our spacers up to.



Whether we use a machine to dig or not, the most important part of the hole is the bottom. The bottom should be tamped/packed; we like to use the flat end of the digging bar for this purpose but a 2x4 or 4x4 works equally well. No matter what we use to firm the bottom, the **worst thing that can be done** is to put dirt back in a hole. Packed or not, this can settle in a few years and leave the fence looking like “who did it and ran”.



We find it helpful to place a stake at the string line between every hole as a marker to insure a straight run. You might be surprised at how quickly the string, and with it, the fence can wander. The line should remain taut as the fence is set. Marker stakes are removed as we work our way down the line.



Post preparation is strongly suggested. We like to cut a small triangle out of one corner of the post about 8 - 10 inches from the bottom to give the concrete a place to ‘grab’. A couple of the self-drilling screws are an alternative to consider. This point also serves as

an initial 'pour to' mark as we plumb the posts and set the desired grade clearance. As is explained later, we fill past the notch after we make any adjustments.



The starting point of an installation is generally at an end or gate post, but we find it best to start setting posts from where we began marking them to dig.

In areas of the country where the ground freezes in the winter, the best way to prevent posts from heaving is a deep hole (penetrate the frost line and add six inches) with the top of the cement about 8 - 10 inches below grade.

Aluminum posts will develop condensate on the inside and there is also a good chance that rainwater will find its way in where the rail and post join. Accumulated water will rupture the post at its corner when it freezes. To avoid damage to the posts in the area between the grade and the bottom of the bottom hole, efforts are made to keep them drained.



As mentioned previously, loose dirt should never be put back in the hole. This may be a tempting solution if you think you've dug too deep and want to save on concrete. Installation longevity comes from proper post depth so we **purposely** over-dig and drain the posts with a piece of PVC. 1-1/2 inch pipe or electrical conduit is dropped into the post **before** inserting the rail ends. We prefer this method over a 'weep hole' drilled in the post right at grade.



Using the string as a guide, we set the first post plumb and level and not much more than a 1/16 of an inch off the line with attention to the grade. By staying off the line with the posts it remains straight. It is important that the string stays as tight as possible as the panels are installed; we check periodically to be sure that nothing is interfering with the line. As long as it's tight, a simple 'snap' should return it to the correct position. This is where it's nice to have stakes between holes; a quick glance will tell if the line is where it should be. Concrete at the first post is poured to just below the notch and we set the post at 'pretty close to exact height', but higher is better than lower. This concrete is given the chance to set up fairly well. Set time will vary depending on temperature and water content in the mix.



When it's time to install the section we lay out 'spacers' to support the bottom rail and keep the correct clearance from the grade. We use pieces of vinyl fence pickets close to or right at the post. 2x4's or 1x4's work just the same. We keep our eye on where the post is at on the string. Even the best installers can mistakenly throw the line off. On level ground, we can sometimes get 3 or 4 sections ready to be poured at one time.



We use digging bars in the hole alongside the posts to hold them as the concrete is poured. It is advisable to 'poke' the concrete to eliminate any air pockets. We pay

attention to the location of the screws on the rails to be sure they are all on the same side of the enclosure. The digging bars are used to adjust the 'plumb' of the post before the concrete sets. We keep a bucket of water with a thick sponge close by as we install to remove excess concrete from the posts or rails (the stuff can splatter); and we do this before it has a chance to dry. Since there is sand in the concrete which can scratch the finish, we hold the sponge in the area above the concrete stain to be removed and squeeze it to allow the water to wash away abrasive matter; then we wipe it clean. Hand prints that may have cement in them are also cleaned off right away so the lime does not stain or etch the powder coat finish.



We maintain the 1/16 of an inch gap between the post and the string and constantly check the plumb of the post.

Occasionally it is difficult to get the inside edge of the notch to sit perfectly on the post, to overcome this a screw is placed through the top rail at a slight angle inside the post as shown below. As the flange of the screw makes contact with the inside wall of the post it will draw the notch closer and closing the gap outside. ***Remember - care should be taken to have all the picket screw heads on the same side of the fence.***



If the installation requires that the fence is level as opposed to following the grade, we find it more effective to use a post from post top to post top and place the level on it rather than on the rail of the section itself. This is especially important when using a short level. The rails might become slightly distorted while the section is sitting on spacers located closer to

the middle of it and the posts are 'hanging' into their holes. To avoid this tiny 'crowning' effect, the spacers should be as close to the posts as possible. Where the fence follows grade, the spacers used between the bottom rail and the ground will allow it to follow the contour. Depending on the severity of the grade, adjustment to the bottom part of the rail end openings may be necessary to accommodate the angle. A small metal file is used to make the a bit bigger.





Once we're sure the post is straight; plum and level, and we've given the concrete a chance to harden a bit, we can remove our digging bars and make adjustment to the height paying close attention to the measurement between the bottom rail and the grade. It's better for us to set the post a bit higher at first, but usually no more than  $\frac{1}{2}$  inch - we can tap it down before the concrete gets rock hard. The spacers may need to be repositioned but the concrete is firm enough to support the fence. On a grade,

we'll step back and look at the 'flow' of the top rail and make adjustments the same way.



As we get ready to 'top' the holes with concrete, we might add some larger rocks to the footing taking care not to disturb the post as we place them in the hole. Holes are then filled with concrete, going past the notch; to about 8 – 10 inches below grade. Again, we 'poke the concrete and are careful about splatter - we remove any before we leave the post. The hole is usually backfilled with dirt; we make a last vertical check with the level and make any final adjustments. We leave the spacers in place and

don't disturb this post again. We sometimes even wait till the following day to 'top' the holes; but of course we know the posts are 'perfect' before they're allowed to set overnight.



If we 'top' the holes the same day or not, we continue to lay out our spacers and install the sections maintaining the same  $\frac{1}{16}$  of an inch gap between the post and the string. We move our digging bars from those posts where the concrete has set sufficiently and work toward the corner.



Adjustments are sometimes necessary; if we need to widen a hole we're always careful to remove all loose soil and tamp the bottom again. Location of corners is taken into consideration when we set up our string before digging the first hole. As we're laying out the job, when we get close to where there will be a corner, gate or an end and we know a cut is necessary, we'll measure the spacing on one of the sections to determine where to place the post. When we're measuring at set up time we take into consideration the width of the posts for proper location of our marks.



When we're installing we get to a corner, if the position of the string is off just a little for the next run, we move it closer to the post being sure to make a similar adjustment at the other end of the run. Since we've dug a wide enough hole there should be ample room for this change. We then insure the string is as taut as possible (like a piano string), verify height, set our marker stakes between holes and continue with the installation.



Measurements for cuts are made from the notch at the end of the rail NOT THE END OF THE RAIL ITSELF. If a piece of a section will be used in a location where the picket on one end will be closer to the post than at the other end, we like to have the spacing as close to the same at both ends as possible. It's often helpful to gauge where the cuts should be made by holding your tape against a section and adjusting it so that the distance from the picket to where the notch will be made is even at both ends.

In the photo below; measuring from the notch as described above, we would want our new notch **starting** at 21-1/2 inches to maintain equal picket spacing. Our rail cut needs to be made at about 22-1/2. This requires removal of a picket; we try to make cuts about 1/8 – 3/16 of an inch short of the existing picket hole so that the entire opening is inside the post when the section is installed. Center to center post spacing for this cut would be 23-1/2 inches. Assessing picket spacing at set up time helps with post placement for more a professional result. A cut that is going to be used at a corner will need to be mitered so the rails ends of both sections fit inside the post as shown below.



We use a portable band saw for cuts because it's smoother – there's no hacking action like a sawz-all.



We cut it; file off any burrs, mark it and then we notch it with our special tool.



We often make our marks using a square and an awl or similar tool to scratch the finish; a pencil line may be hard to see on dark material. You may notice that the cut is not exactly on the mark; this allows it to be inside the post where it won't be seen.

A test cut on a scrap piece of rail helps insure the cut is correctly located in relation to the mark.

Back cutting the wall of the post hole inside the opening allows for more horizontal movement of the rails where an arc, curve or **very slight angle** is going to be made. We use a rotary cutter with a metal cutting blade and take extreme care to control the tool because the speed at which the bit spins can rip through the aluminum very quickly.



On 'curved' runs, the side of the rail on the inside of the arc needs to be shortened **a little bit**. Calculating this cut is best done by assembling the section where it will be installed ('dry fit' after the holes on the posts have been opened) and then measuring the space between the rail notch and the post on the **outside** of the arc with a pair of dividers. That space is then marked in the corresponding location on the inside of the arc and the rail is notched. We find that having a decent metal file handy is a really good idea.

When a horizontal or vertical swivel is going to be used, simply 'slapping it on' the rail end **will not maintain proper picket spacing** (less than 4 inches). The end of the rail

that would ordinarily be inside the post **plus** the difference between where the rail end sits in the cup and the flat surface of the mounting plate the must be removed. This measurement varies depending on the angle. Cuts for wall mounts are much easier to figure.



**Gate posts must be exact.** We level using a post across the opening from post to post. Digital readout levels are useful here as they are very sensitive. **The opening must be perfectly plumb.** When setting posts we are careful to check by measuring from gate post to gate post at the top and bottom to insure accuracy. OnGuard gates are 'full cut' so we must allow for hardware. Before it is installed, we like to hold the gate tight against the post where the hinges will be **before any hardware is attached.** This allows us

to check the spacing between the gate and the latch post to be sure it is even from top to bottom. Occasionally, we have to allow a hinge to 'standoff' the post slightly to compensate for any errors. We have had customers tell us that they planned their days work to end at the hinge side of the gate opening. The next day the gate was hung and the gate post on the latch side was then set. Before attaching the hinges, we adjust the spring of the self-closing hinge to the 'neutral' position (no tension) following the manufacturer's instructions included with them.



We are extremely careful when using a power tool to install any screws. Overtightening **will snap off the head of the screw.** After the screw cuts the hole, we 'bump' the trigger till the head gets close sometimes stopping to adjust the clutch or finishing by turning the chuck manually. There are few things more frustrating than snapping the head off the last screw and having to take everything apart to remove it. Generally, we install the hinges on the gate first using only 2 screws and we **always check twice**

**to be sure the picket screws are on the same side of the enclosure as the panels. Gates on pool enclosures must open outward!**



After we've installed the Magna latch according to the instructions provided by the manufacturer we go back and install the post caps checking first to be sure we've screwed the sections together as previously described. We install the caps with the 'heel' of our hand. When installing gate caps on the latch side we like to support the bottom of the gate.



When the installation of sections, gates and latches is complete, we go back over the job and wash it by hand using a car wash solution. We suggest this be done twice a year to help maintain the finish. The time spent properly installing the fence is a worthwhile investment that will be rewarded with many years of safe service.

Notes:

1. We use cut sections of 5/8 rebar approx. 30 inches in length for attaching string lines to. We like to use protection devices to prevent injuries such as by scratching.

2. "Isolation fencing" is a term used to describe a pool enclosure that does not include any part of the house/structure as a portion of the barrier.

3. The measurement from the wall of a building to the side of a post **must be less than 4 inches**.

4. OnGuard gates are 'full cut' which means a 48 inch wide gate is a full 48 inches. Some other manufacturers make 'dimensional' gates; a 48 inch gate that fits in a 48 inch opening. For an OnGuard gate we **must** allow a minimum of 5/8 of an inch on either side of the gate for hardware. A 48 inch gate requires an opening of no less than 49-1/4 inches. Gates hung in openings greater than that required will not appear centered in the opening. Gates hung in smaller openings can have problems binding on the latch side if a Magna Latch is to be installed or worse yet – may not close at all. On a double gate a minimum of 5/8 of an inch must be allowed on the hinge side of each 'leaf' plus 5/8 of an inch where the 2 leaves come together (3x5/8 of an inch plus the total width of the 2 gate 'leaves').

5. **Maximum distance from the bottom rail to the finished grade is two inches** as per the BOCA code.

6. Rail end clippers are **BRAND SPECIFIC!** A different cutting head is made for the majority of different fence brands. They are available for purchase or to our customers for a small rental fee.