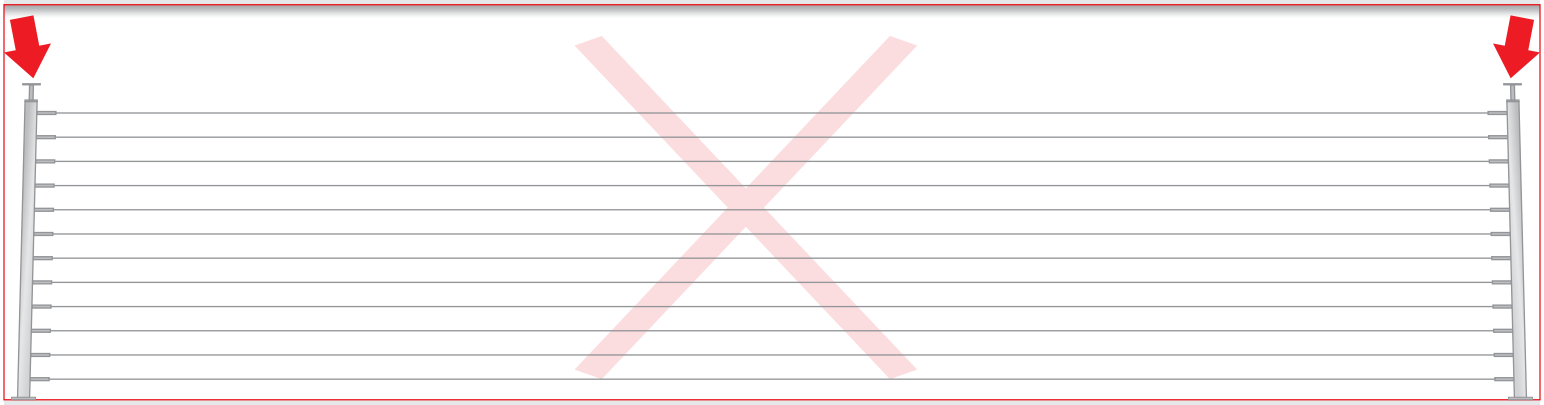
Understanding a cable railing system

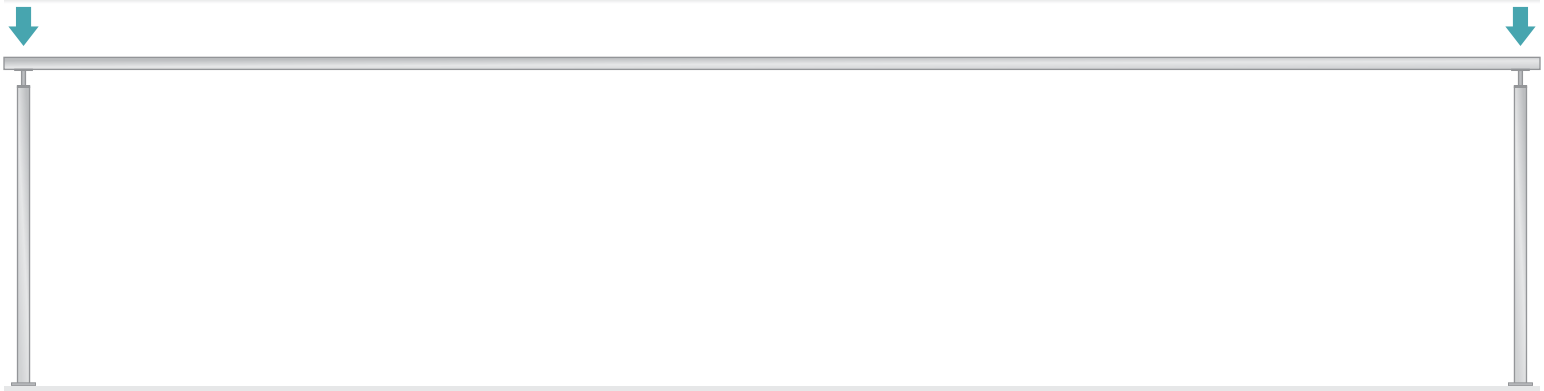
And why the price per linear foot can vary so much from project to project?

First, we need to understand that a cable railing system is based on a series of stretched stainless steel cables anchored on two opposite ends. We need to have two posts for cables on each end of your run, or the straight line that you want your railings to cover.

Before we start attaching the cables to the posts, we need to make sure that the posts will stay in place (plumbed) and won't bend inwards with the tension of the stretched cables. This will not only look incorrect, but it will also sag the cables which won't be stretched anymore.



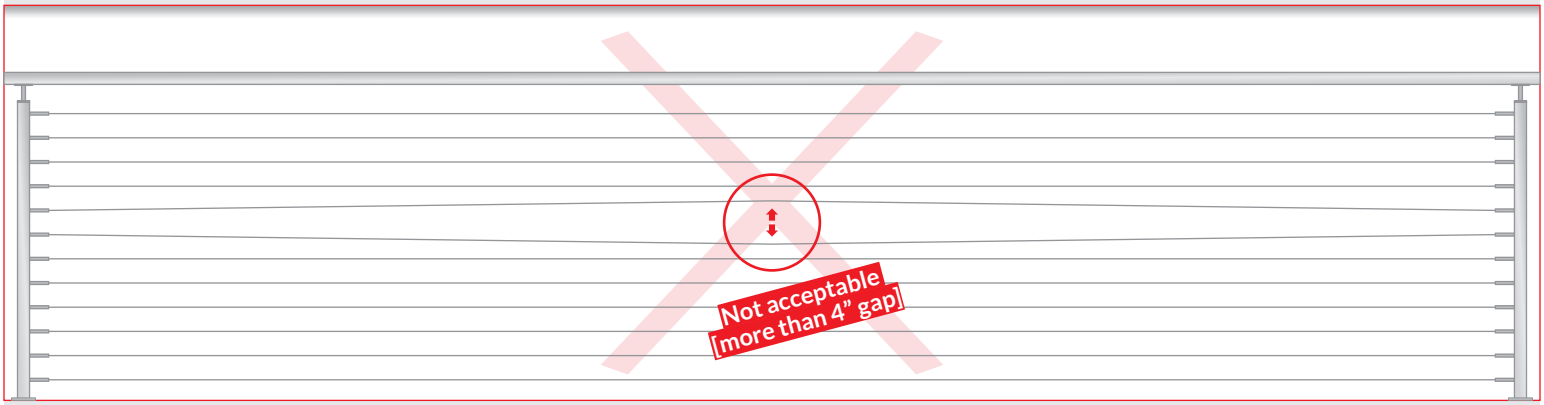
In order to avoid that situation, the second part of a cable installation would be the installation of the top rail.
A screwed top rail will also separate every post with the correct distance creating the ultimate frame for the cables, avoiding the risk of having the posts getting out of plumb inwards and allowing the cables to keep the proper tension.



There's another concept we need to cover before moving forward. The setup displayed on the sketch below is still **not acceptable**. That's due to the fact that the distance between posts is still too great. If we create such a system, even though the cables will be tense and stretched, if an opposite force is applied to two adjacent cables, that force might be able to create and opening or gap that will surpass the maximum aperture allowed by Code which is **four inches**.

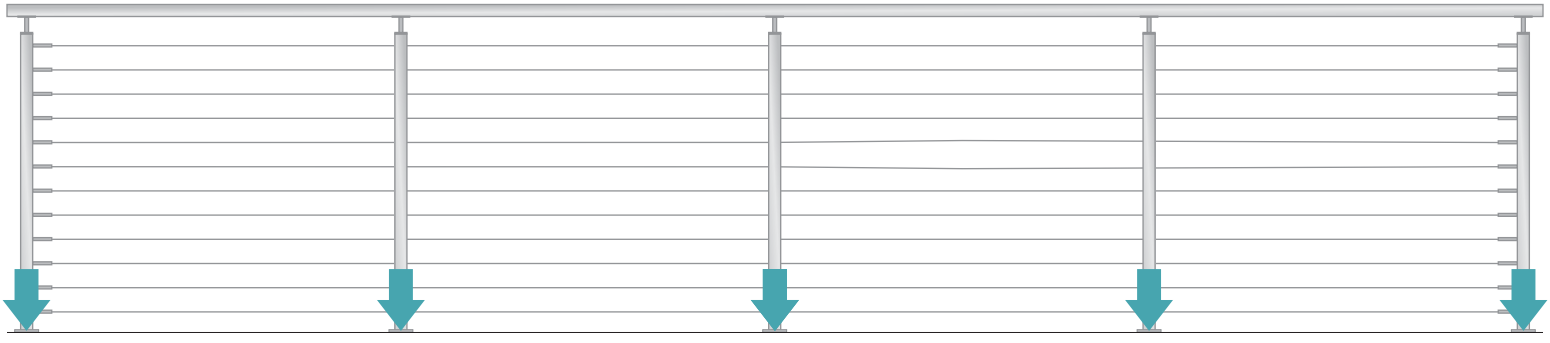
That's what we call the *deflection effect*.

In this case, your cable railing won't be approved by your Inspector and/or, the railing system won't be code-compliant.

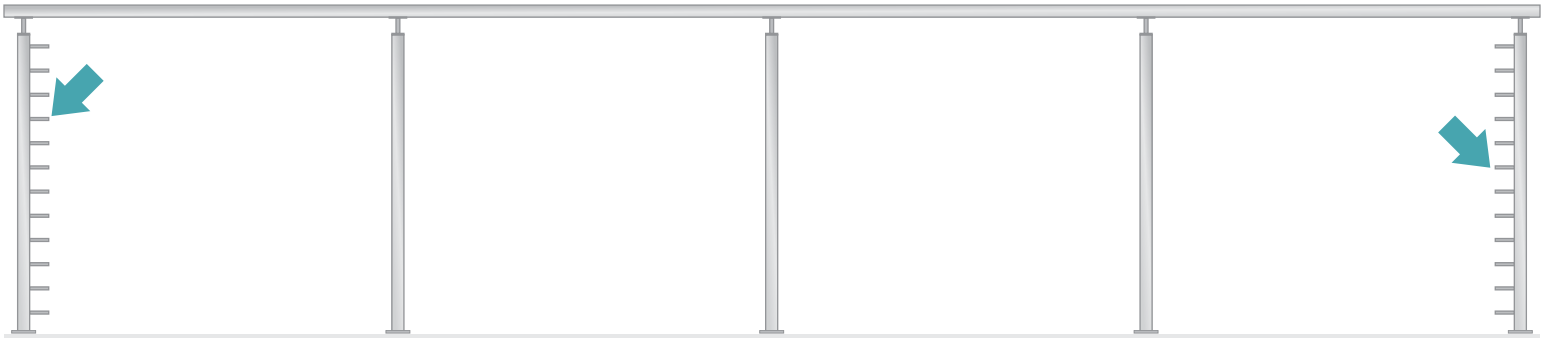


That's why cable posts should not be installed more than **four feet** apart from each other.
With such a configuration, the *deflection effect* won't be a cause for concern because the stretch will be minimal and the gap created won't be larger than four inches. That's why our cable posts are designed with a 3-inch spacing between cables. When the cables are stretched, the space between them is still one inch narrower than what's required by Code, but that's the margin necessary for the cables not to deflect to more than four inches apart from each other at any point. That's one of the reasons the maximum 4 feet between posts is required.

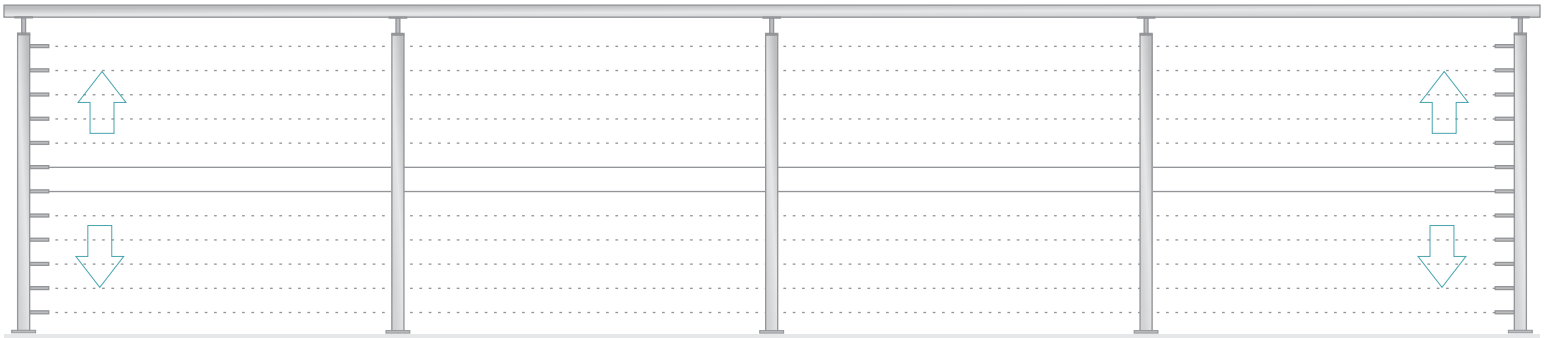
The other reason posts can't be more than four feet apart is for the railing to have the required structural strength necessary to withhold all the loads required by Code.



Now that the concept of having posts every 4 feet and the top rail attached before running the cables, we can move forward, which is attaching the fittings: the tensioners and/or ends that will grab/pull the cables to the end posts.



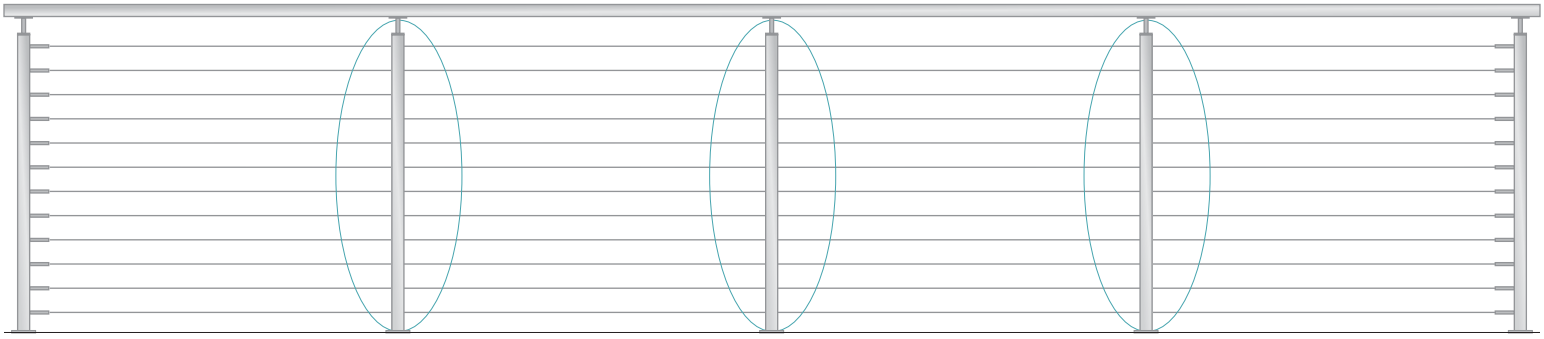
Cable should be stretched and cut basically to the side of the whole run. After the cables are cut, they should be attached to a tensioner or end fitting (we provide specific instructions on that) that will hold the cable in place. After that, special adjusments on the hardware will be necessary to pull the cable a bit to create the tension necessary for the system. The first cables to be installed should be the ones in the middle of the post and after that, the ones next to them until you reach the ends of each of post (top and bottom).



After all the cables are in place and tight, your job is **done**.

Two additional notes:

1. As you might have noticed, there's no fittings on the middle posts. Those are not necessary.
You only need the fittings at the ends - the ones that will hold and pull the cables. The posts in the middle are called *through posts*. Those will have the cables going through their holes with no extra hardware needed.
The posts are there to create structural strength and not to let the cables deflect more than they should (the *deflection effect* mentioned earlier).

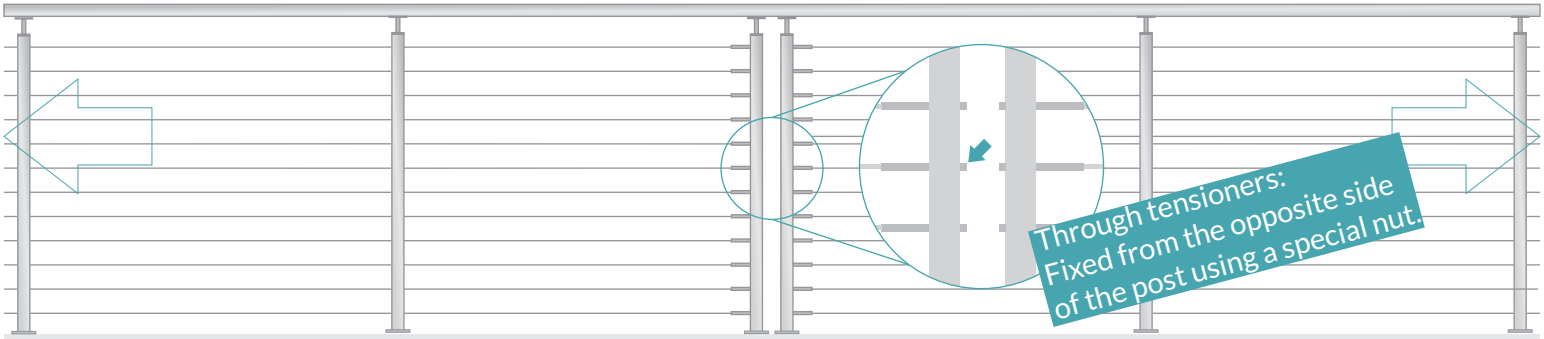


2. There is a limit on what a tensioner or fitting can hold and in most cases (depending on the hardware supplier) this limit is 25'. That's the max you can go with a pair of fittings (two tensioners or one tensioner plus one end). If you create a straight run of cable railings that's more than 25', your system will be prone to have cables escaping from the fittings or having cables sagging (hardware losing the tension) which might cause excessive maintenance or repairs.

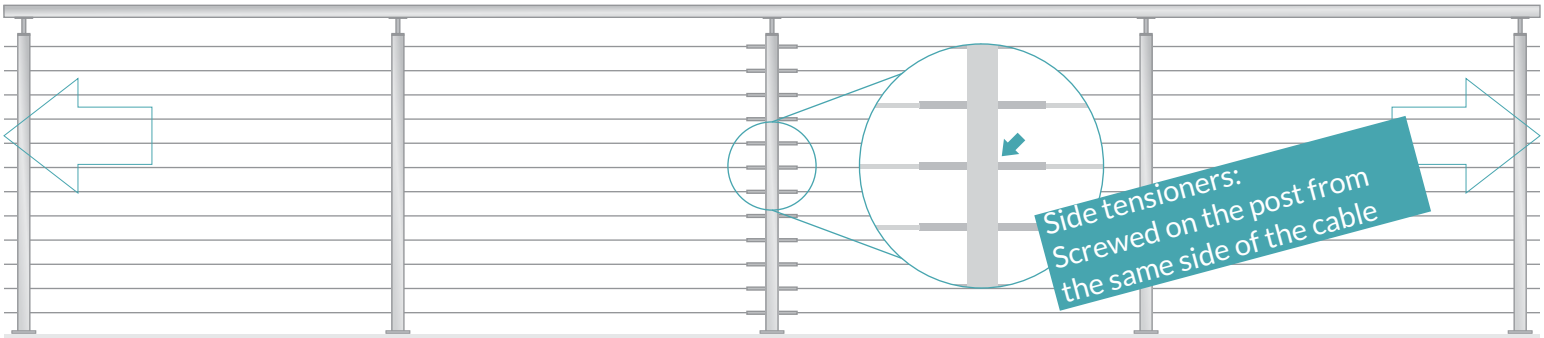
What if my railing stretch or run is longer than 25'?

In those cases, you need to create multiple *runs* for your cable railing. And none exceeding 25'.
One run should *end* and another one should *start*. The middle connection will depend on the cable system that you are using. Some systems will require a double post configuration. Those are the systems that the fittings are attached or fixed on the opposite side of the post. Some systems can have only one middle post with fittings attached to each side of the unit. Please check below:

Double post configuration:



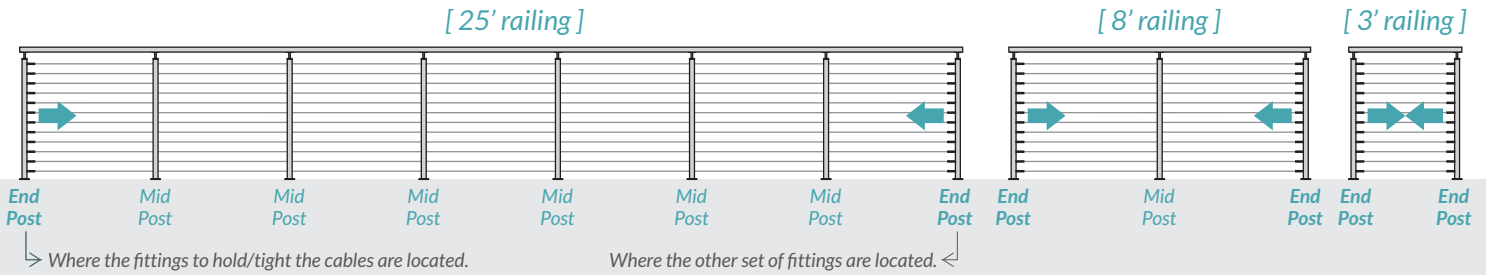
Single post configuration (middle connection post):



So, why the price per LF on a cable railing system can vary so much?

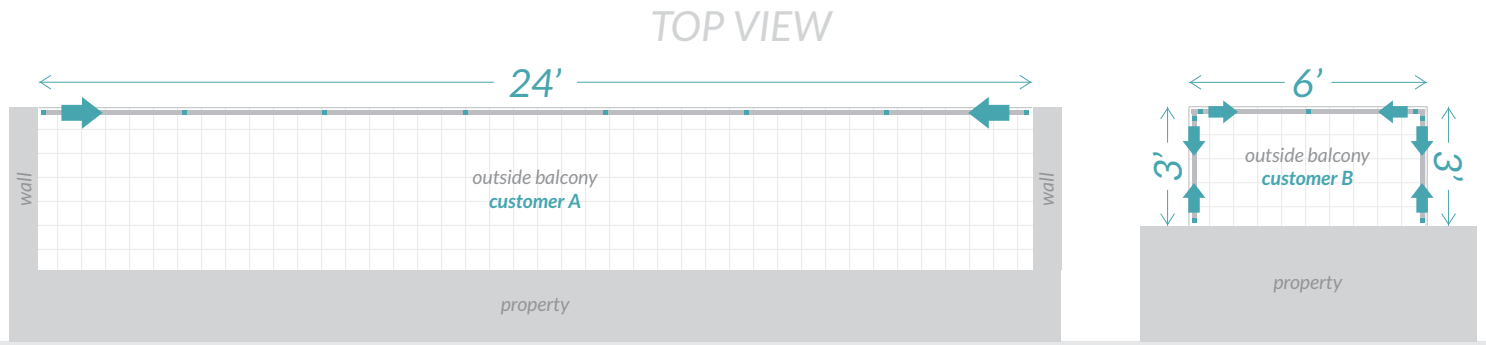
As explained earlier, a cable railing system depends on straight areas with a pair of posts at the ends serving as anchors for the cables. On those posts, we need a series of fittings (tensioners and/or ends) and after those are in place, we cut cables, attach to these fittings and stretch them.

As you can see below, this will be the same procedure if you have, for instance, a 3' run, an 8' run or a 25' run (maximum you can go - as explained earlier):



As you can see on the examples above, the amount of fittings is exactly the same for the three railings even though the 25' run is more than **eight times longer** than the 3' one. Both customers will have to pay for the same amount of tensioners and/or ends (a considerable part of the cost of a cable railing). The labor to assemble all of them will only differ by the number of middle posts to be screwed to the bases. The labor to attach the fittings, cut and attach the cables, and create the tension will be exactly the same on the three examples.

This can get even more interesting when we consider all the areas of a project:



The customer detailed above on the left (*customer A*) has one long stretch of 24' and the customer on the right (*customer B*) needs to enclose the three sides of that balcony with railings. Even though *customer A* has double the railings (linear footage), *customer B* will use three times more fittings! *Customer A* has one run of cables while *customer B* has three. *Customer A* also have only one extra post than *customer B* even though the area covered will be double. The amount of hardware and labor considering the fittings and cables on *customer B* will be three times the amount spend by *customer A*.

To sum things up: the cost of a cable railing will be directly influenced by the number of runs (and the lengths of it) or straight areas you'll have at your project. As a rule of thumb: **the longer the runs, the lower will be your cost per linear foot installed**. That's why cable railings are a good fit for larger areas like balconies and decks. Small projects or projects with a lot of changes in direction, angle, or level will most likely cost less using glass or modern steel railings.