Simplified Stair Building With Landings

By Greg Vanden Berge

Published by Greg Vanden Berge

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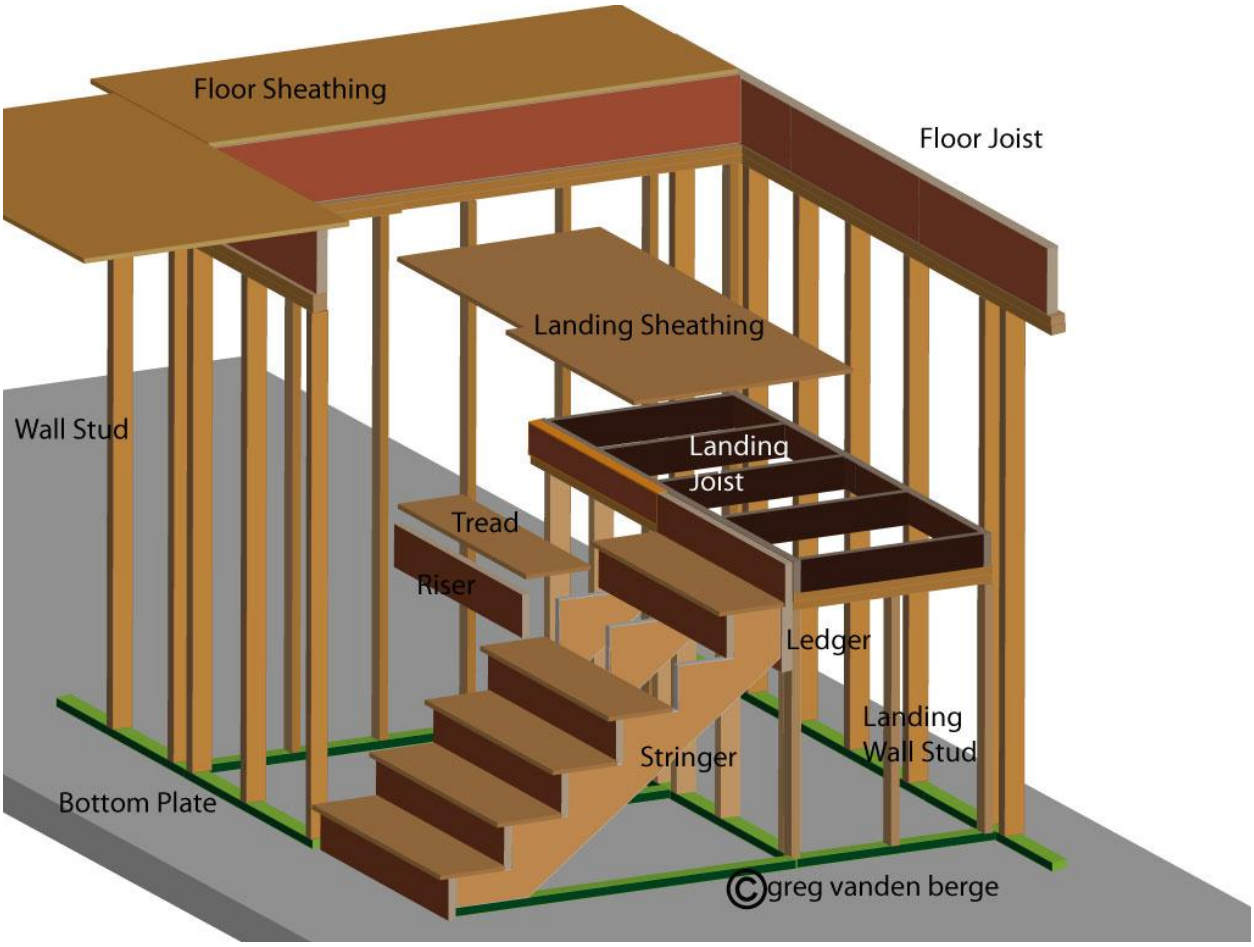
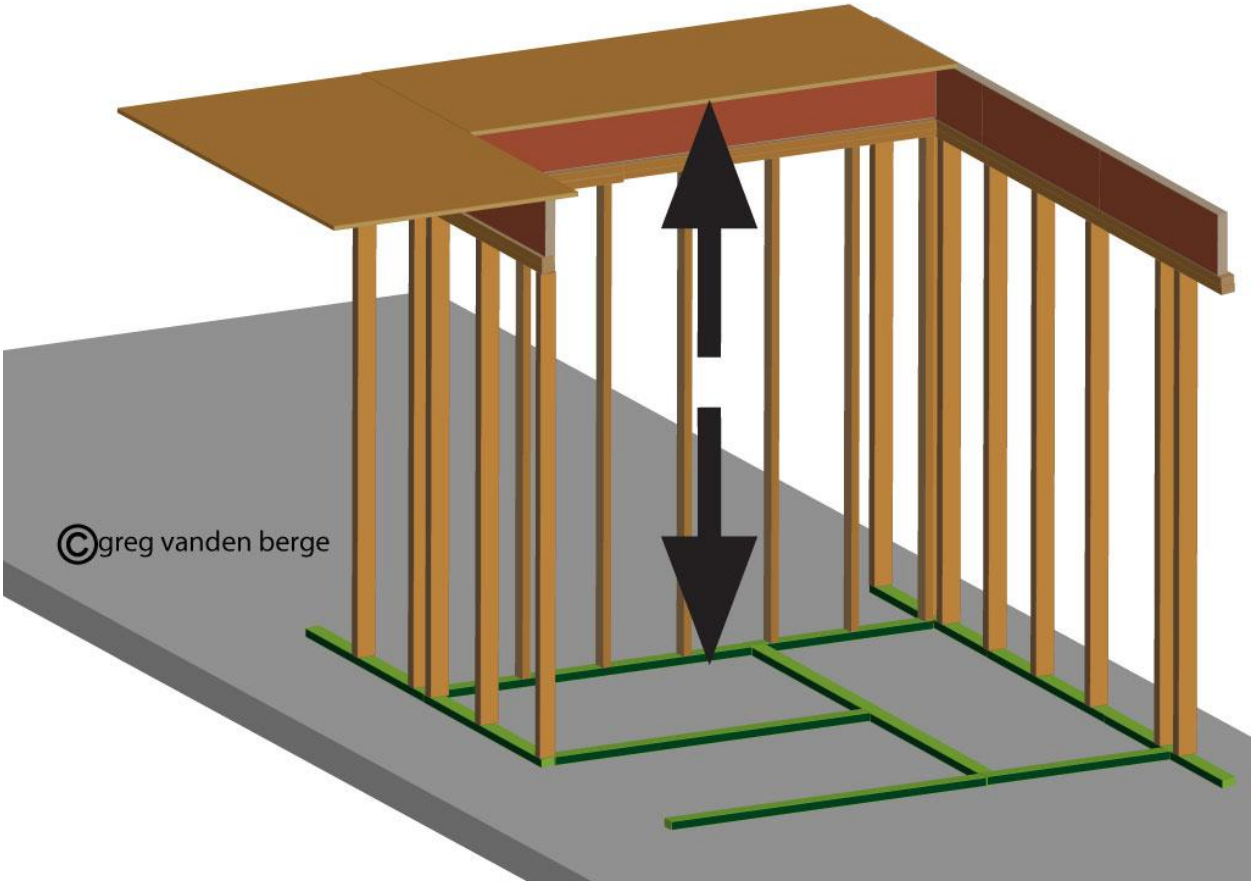
Stair Parts



This illustration should give you a general idea about what parts of the stairs go where and what they're called. If you need more information about certain parts of a stairway, then feel free to visit our online glossary.

http://stairs4u.com/glossary.htm

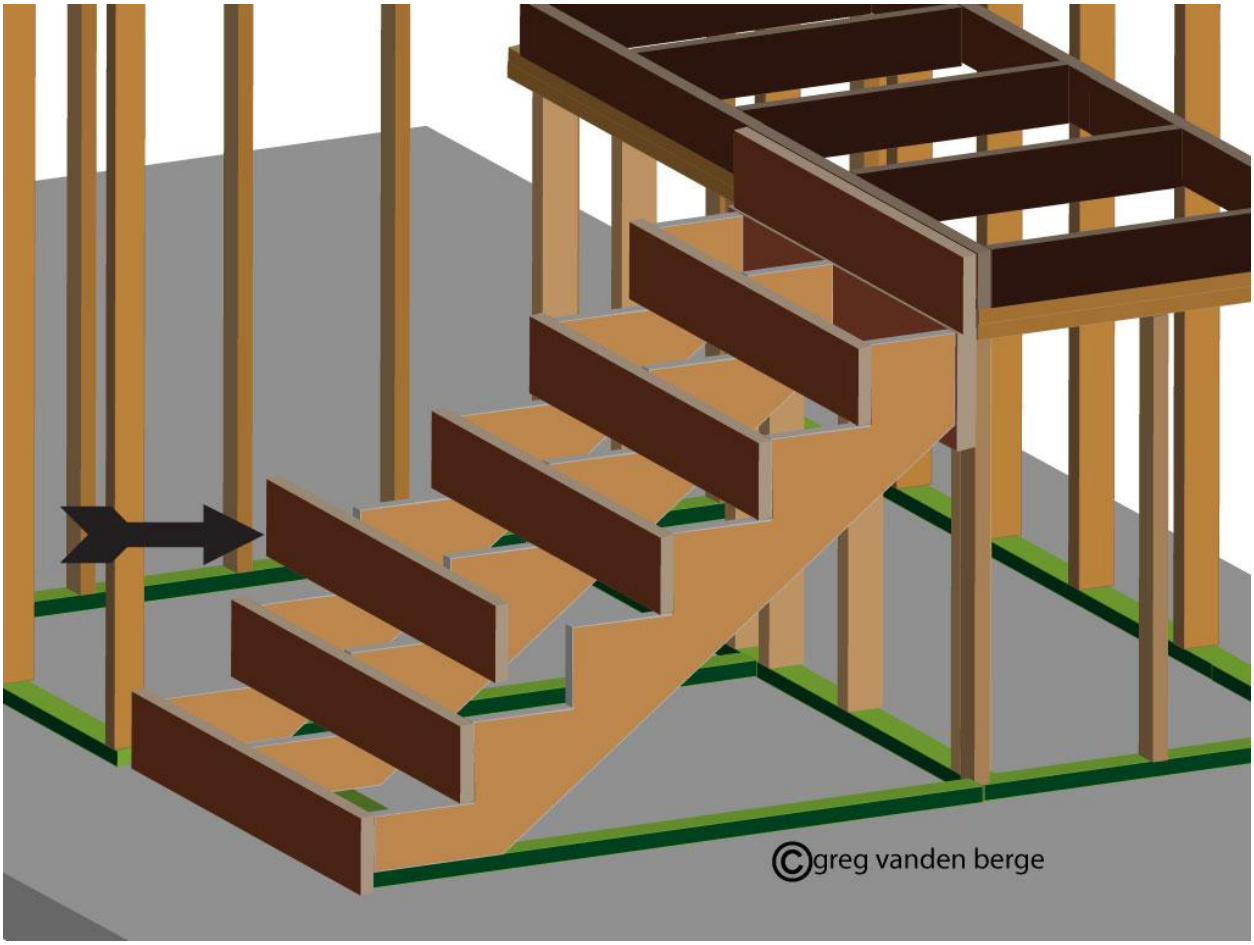
Measuring The Stairway



Rise

This is the overall vertical measurement of the stairway. The rise will be the measurement in between floors. This would be the vertical distance (up and down) from the bottom floor to the top floor.

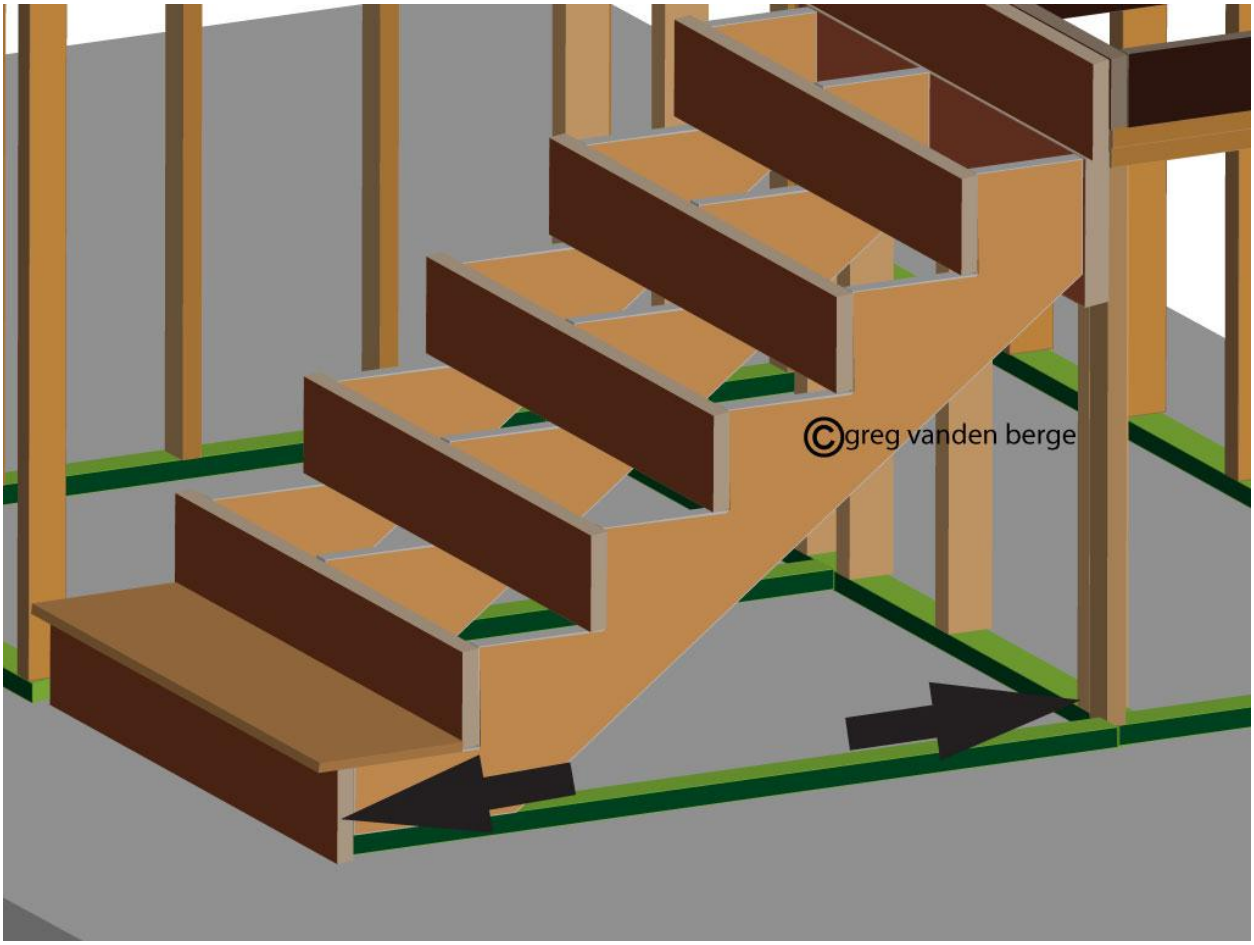
In order to make things as simple as possible, we're going to use 7 1/2 inch risers in every example, of this book.



Riser

This is the vertical distance in between each tread or step. If the overall rise measurement of our stairway is 105 inches and we know we're going to use 14 risers, then we simply divide 14 into 105, to find out the height of each individual riser.

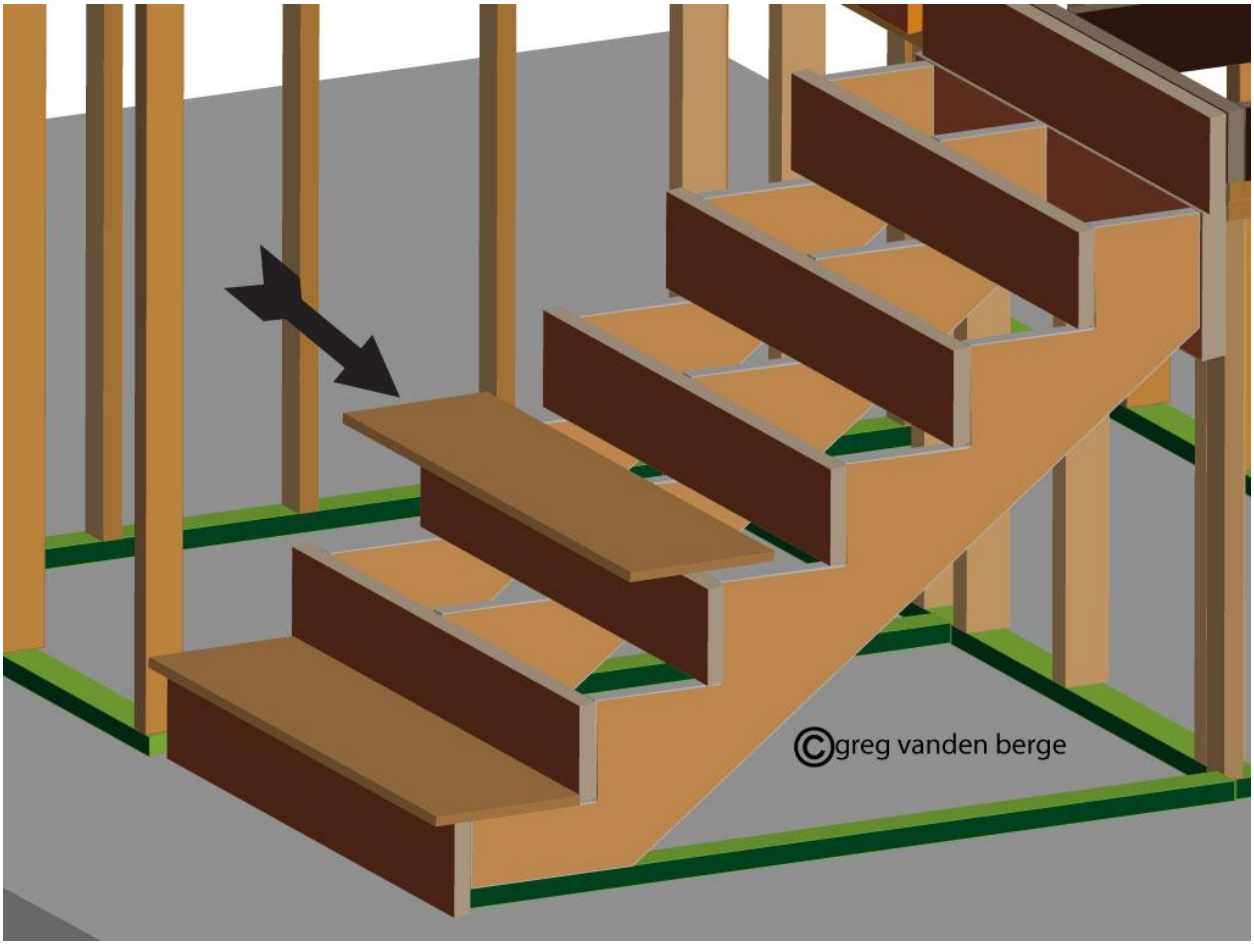
14 divided into 105 inches provides us with a 7 1/2 inch riser. This is one of the measurements we will use on our framing square, when laying out our stair stringer, however your riser measurement could be different.



Run

This is the overall horizontal measurement of the stairs with out the landing. Most of the time the individual stair step or tread measurement will determine the run.

For example: If a 10 inch wide tread along with the individual riser measurement, created the perfect step then we'll use it to figure out the length or run of the stairway. Instead of taking an overall horizontal measurement and dividing it by the amount of treads (like we did with the overall rise), we're going to take the individual tread measurement and multiply it by the amount of steps required to build the stairs, to figure out the overall length or run of the stairway.

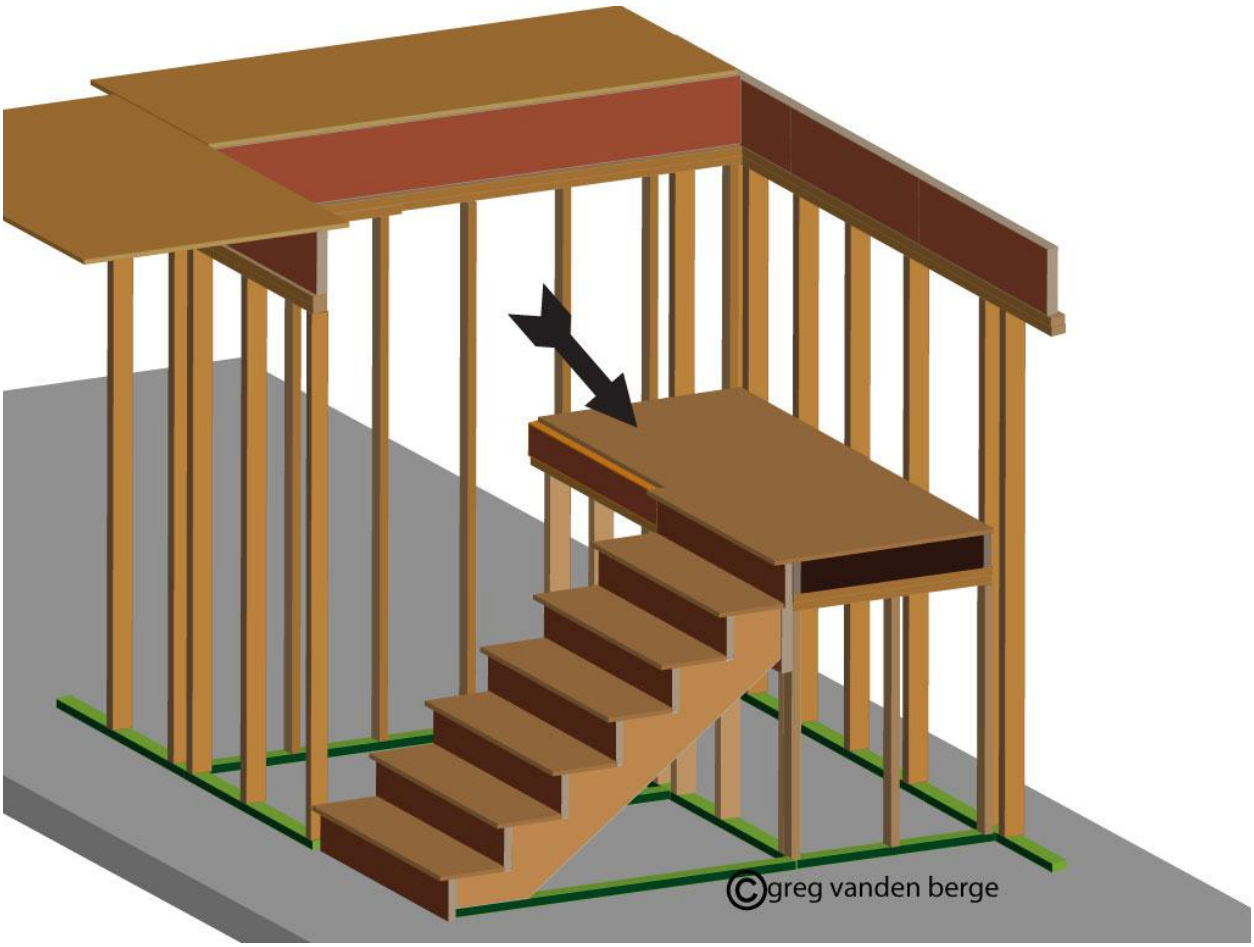


Tread

This is the individual horizontal distance and width that will represent each step on the stairway. The most common stair tread width used in construction today is 10 inches, with a 1 inch overhang or 1 inch undercut.

Don't forget to add your 1 inch overhang to the width of your stair tread, before cutting them. This is a big problem with beginner stair builders.

If you have a 10 inch wide stair tread stringer layout measurement and desire to have a 1 inch nosing then you will need to layout and cut 11 inch wide stair treads.



Landing

The width and length of the stair landing or landings used in your stairway will be critical. As a general rule of thumb, 36 inches is the minimum distance in either direction for a stair landing, in most cases.

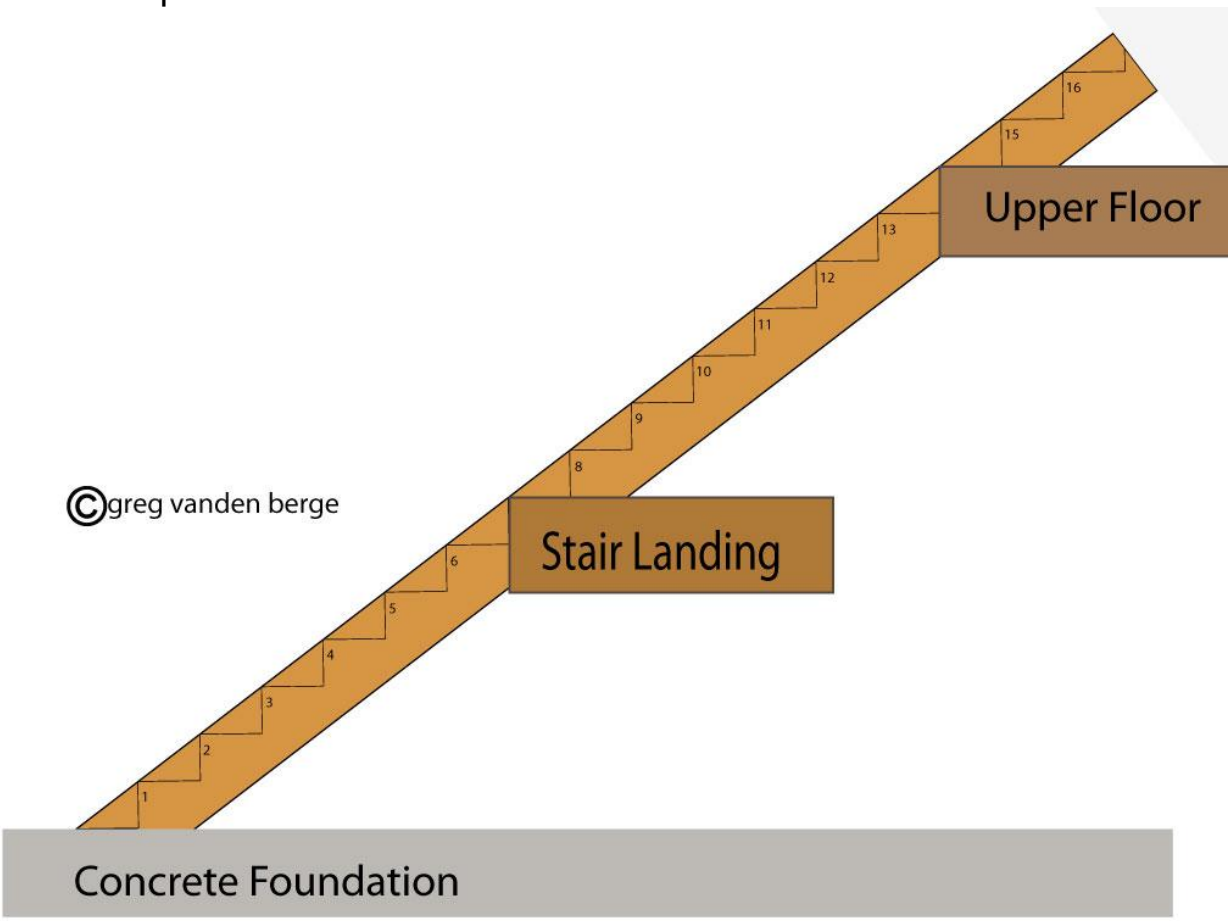
Check with your local Building and Safety Department for more information.

Landings with access to doors could require larger landings.

Single Mid Landing

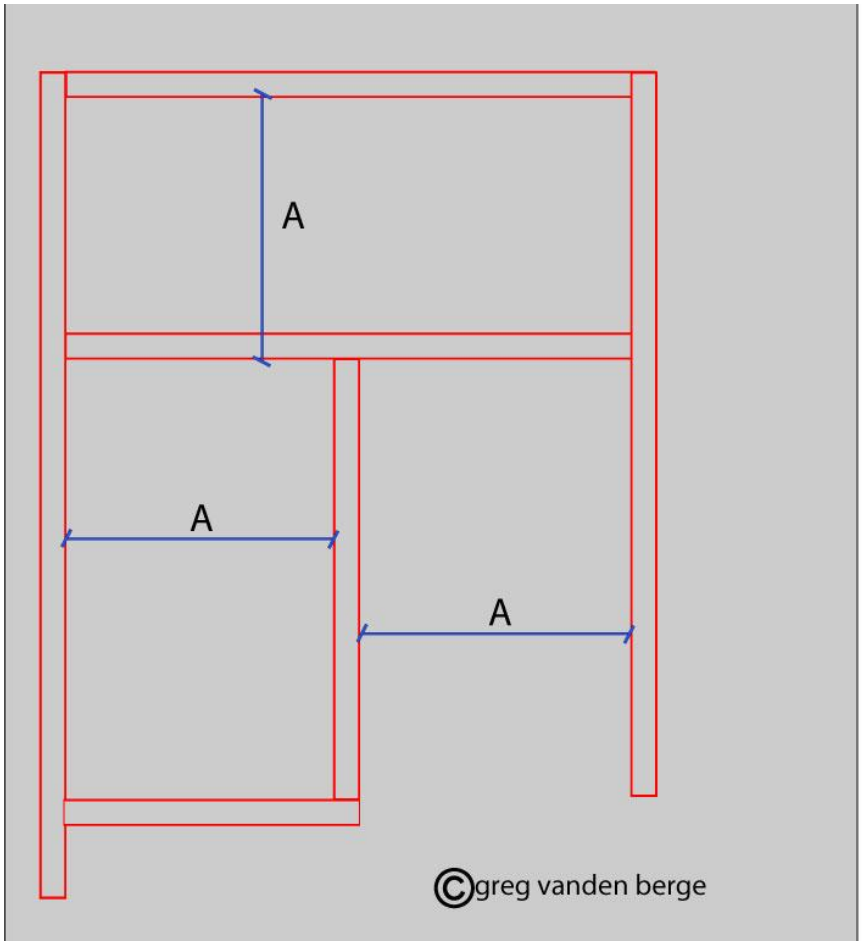
In this book I'm going to try something a little different. I'm going to show you how the stairway is constructed, using a simple step-by-step set of directions and illustrations.

I want you to familiarize yourself with the construction process before you even think about cutting your first board. I honestly believe, if you can visualize the project in your mind and understand exactly what you're doing, then the entire process of constructing a set of stairs with a landing, won't be a problem.



In this illustration I placed the mid-stair landing and the upper floor in its proper position, on the stringer. Again, I'm providing as many illustrations as I feel necessary to paint you a crystal clear picture of what's going on.

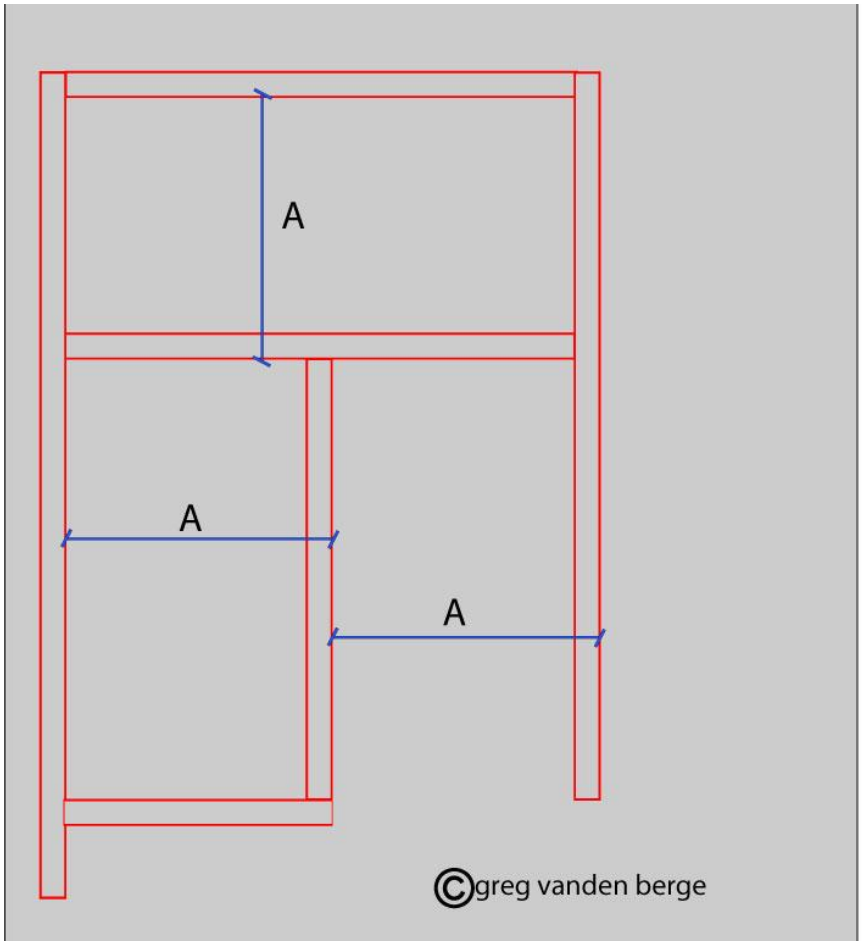
Trust me, I realize some of these illustrations don't make a lot of sense, but should, when you look at and compare them to other illustrations in the book.



For those of you who are familiar with building floor plans, then the illustration above might make perfect sense. However, for those of you who don't, feel free to skip a few illustrations ahead and see if these red lines make any sense.

The red lines represent sections of the building where walls will be built. However, some of these walls will be smaller and some will be taller, but either way they will need to be marked out on the building foundation, before the stairs can be built.

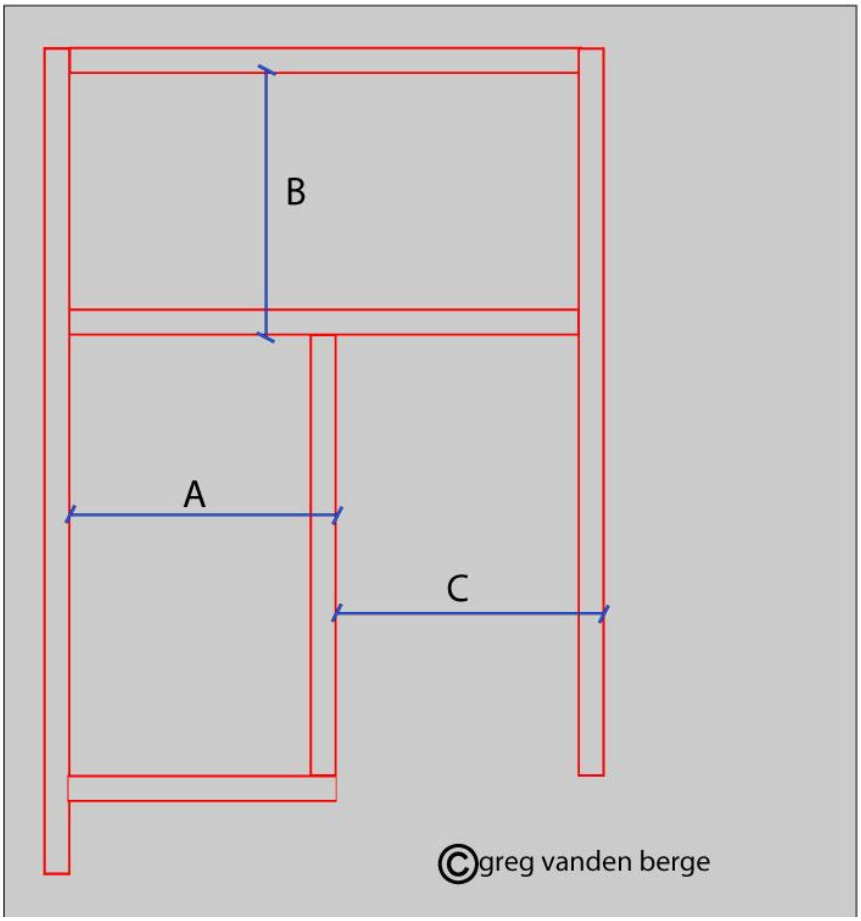
In the illustration above the horizontal measurement lines represent the width of the stairway, in between two walls. In the illustration below the width of the stairs actually goes over one wall, on each side.



The letter A represents equal measurements. In other words, in the illustration above each wall will need to be positioned equally, to construct a stairway in equal proportion.

For example: If the letter A represented 38 inches, then these walls would need to be laid out 38 inches apart. However, some adjustments will need to be made to the landing wall and even the wall where the stairway connects to the upper floor.

More on that later, for now I'm trying to provide you with a simple floor plan with a few different examples to give you a better idea of why you're doing what you're doing.

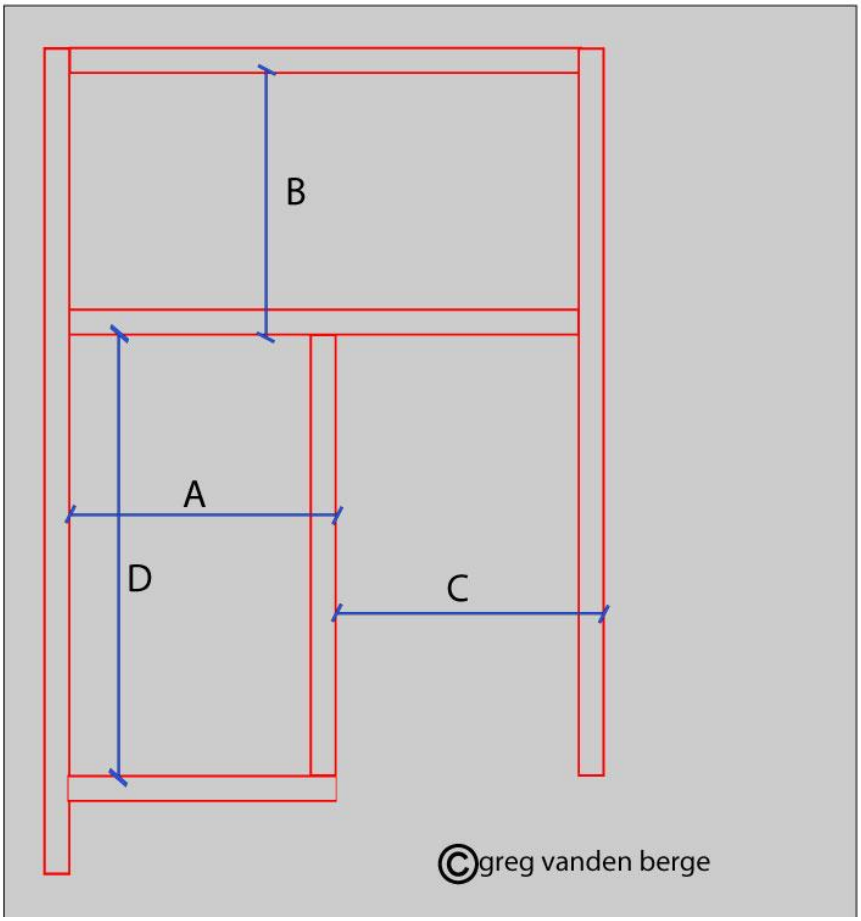


These measurements don't need to be the same. There is no golden architectural design rule stating that stairs need to be built using the same measurements.

All three of these measurements can be different as long as they aren't smaller than 36 inches or the minimum stairway width requirements from your local Building and Safety Department.

For more information about local building codes, you can contact your local Building and Safety Department and they can usually be found through your local city or county government offices.

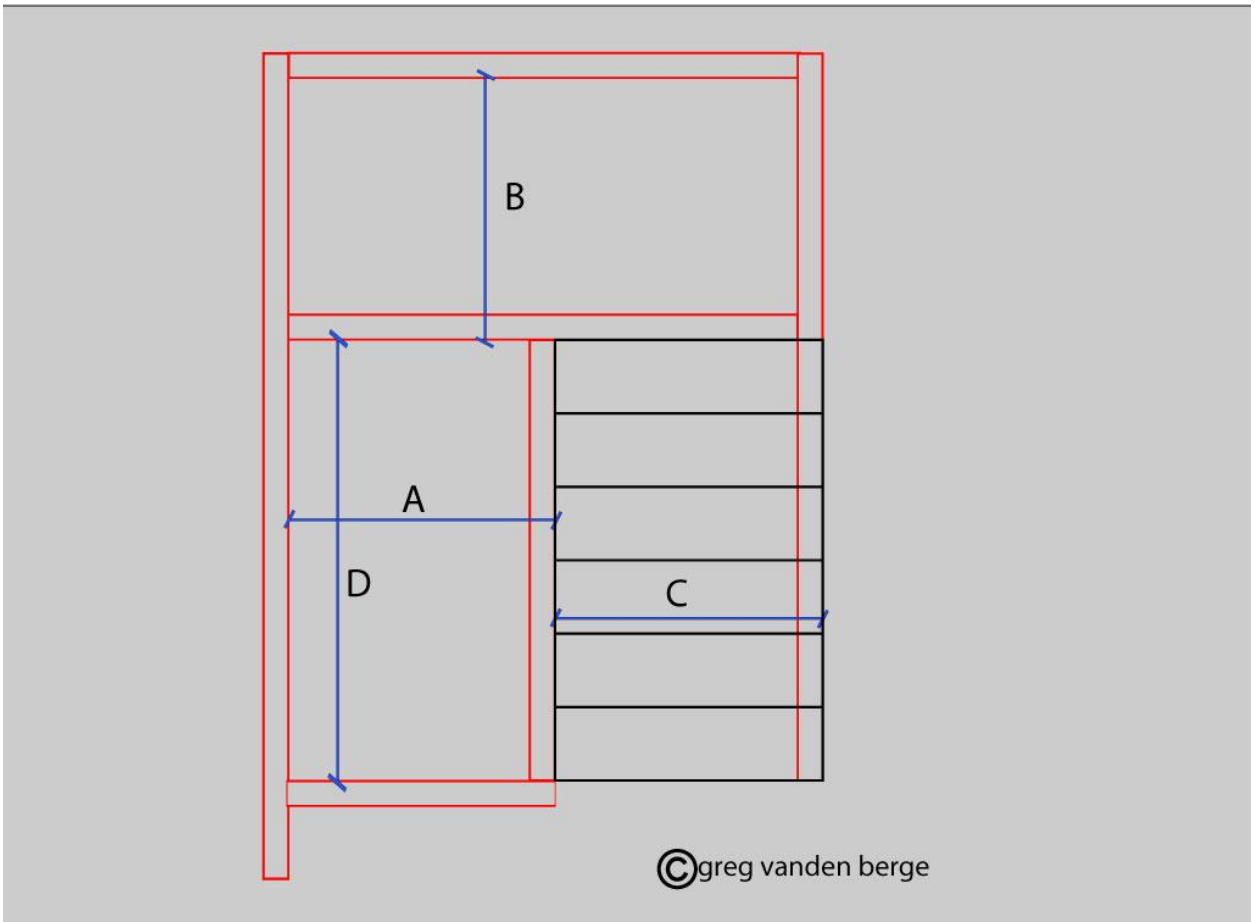
Feel free to click on the link below for more information about stair building codes. http://stairs4u.com/stairbuildingcodes.htm



In the illustration above, we have four different measurements.

Measurement A: Represents the width of the upper stairway.
Measurement B: Represents the width of the landing.
Measurement C: Represents the width of the lower stairway.
Measurement D: Represents the run or length of the upper stairway.

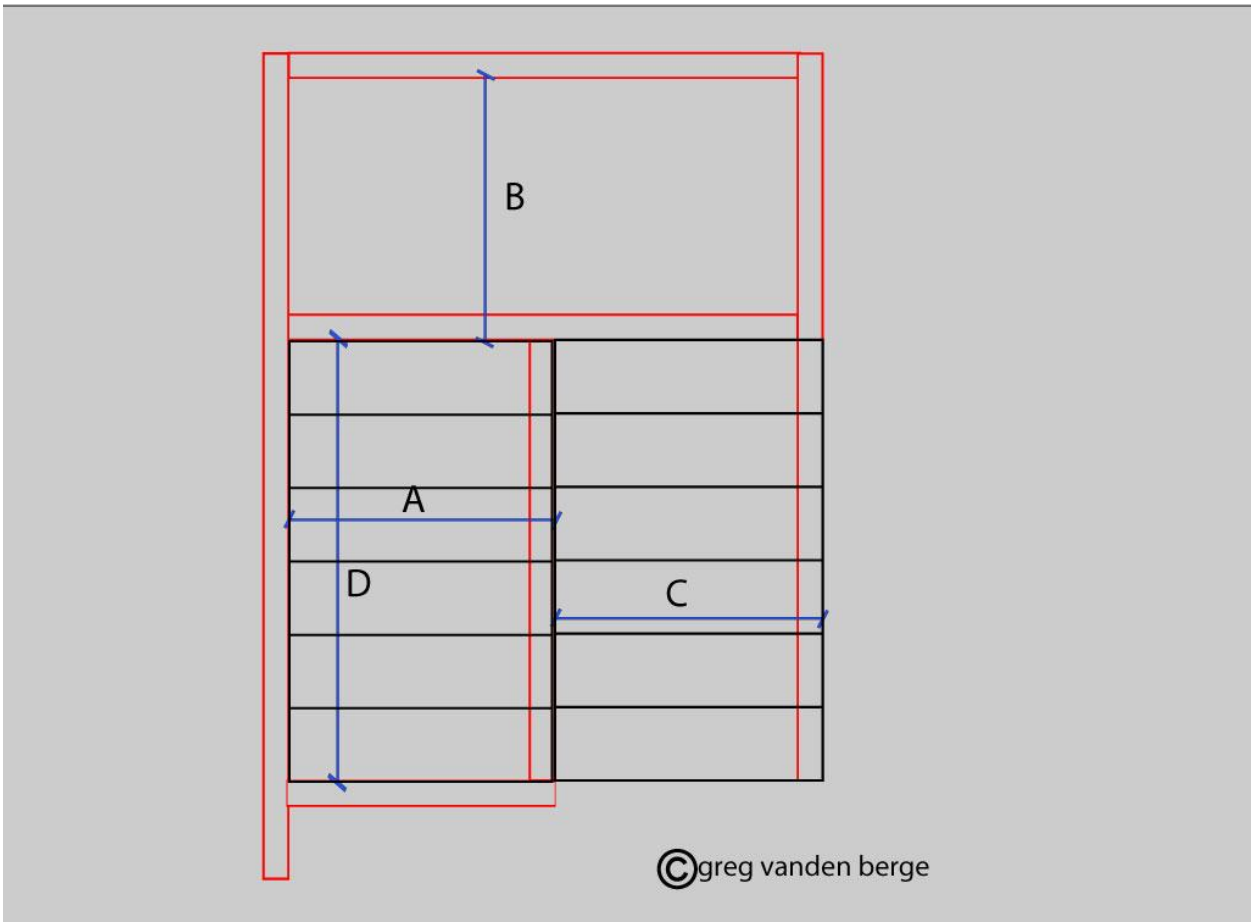
Before we layout our stair stringer's, we need to have a general understanding of what these measurements actually represent.



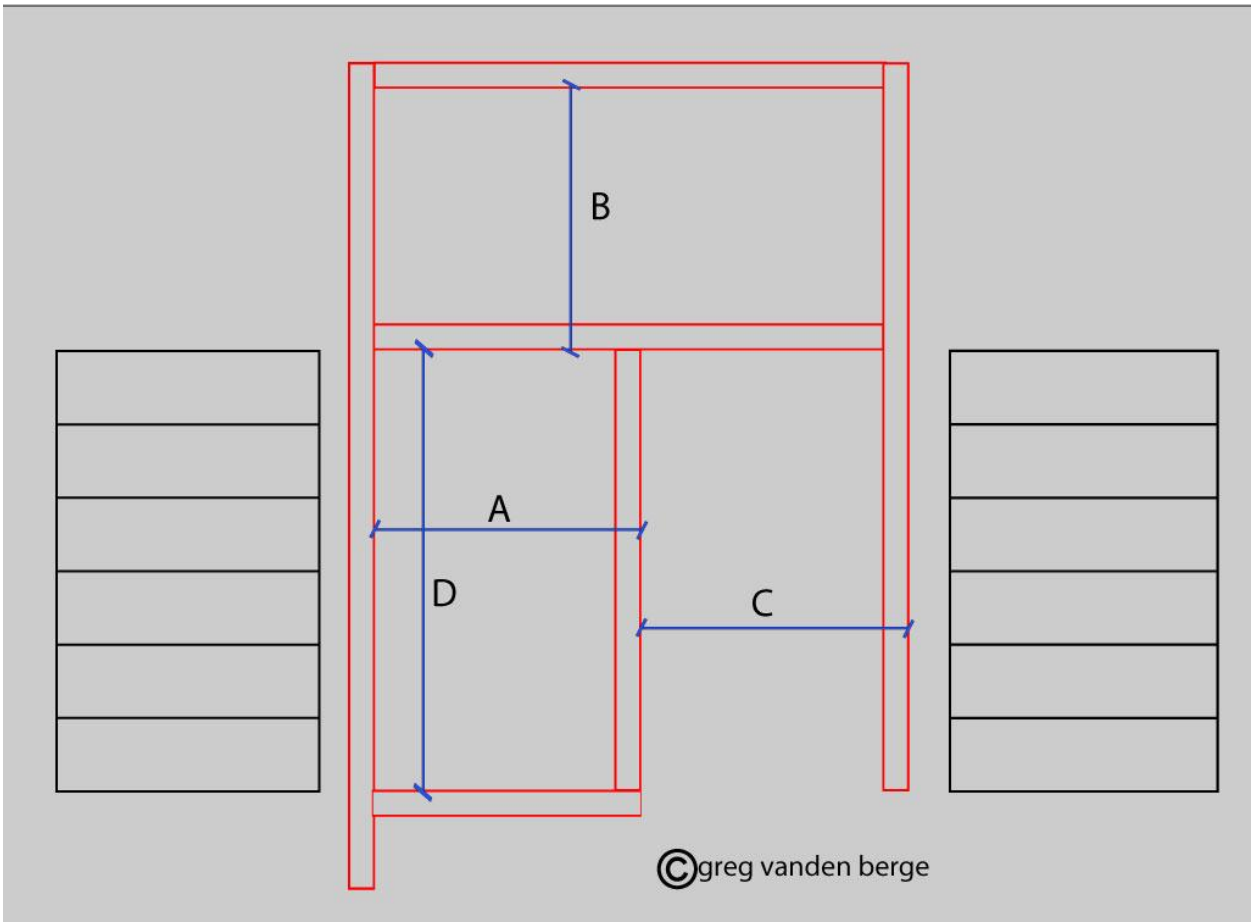
In the illustration above I provided you with a six step stairway. If you could imagine your self hovering directly above the stairway, then you'll have a pretty good idea, what it would look like.

The floor plan of any building provides us with a view of what it would look like, if you were directly above it. Again, feel free to skip ahead at any time to check out other illustrations, if you're having a problem trying to figure out what in the heck I'm talking about.

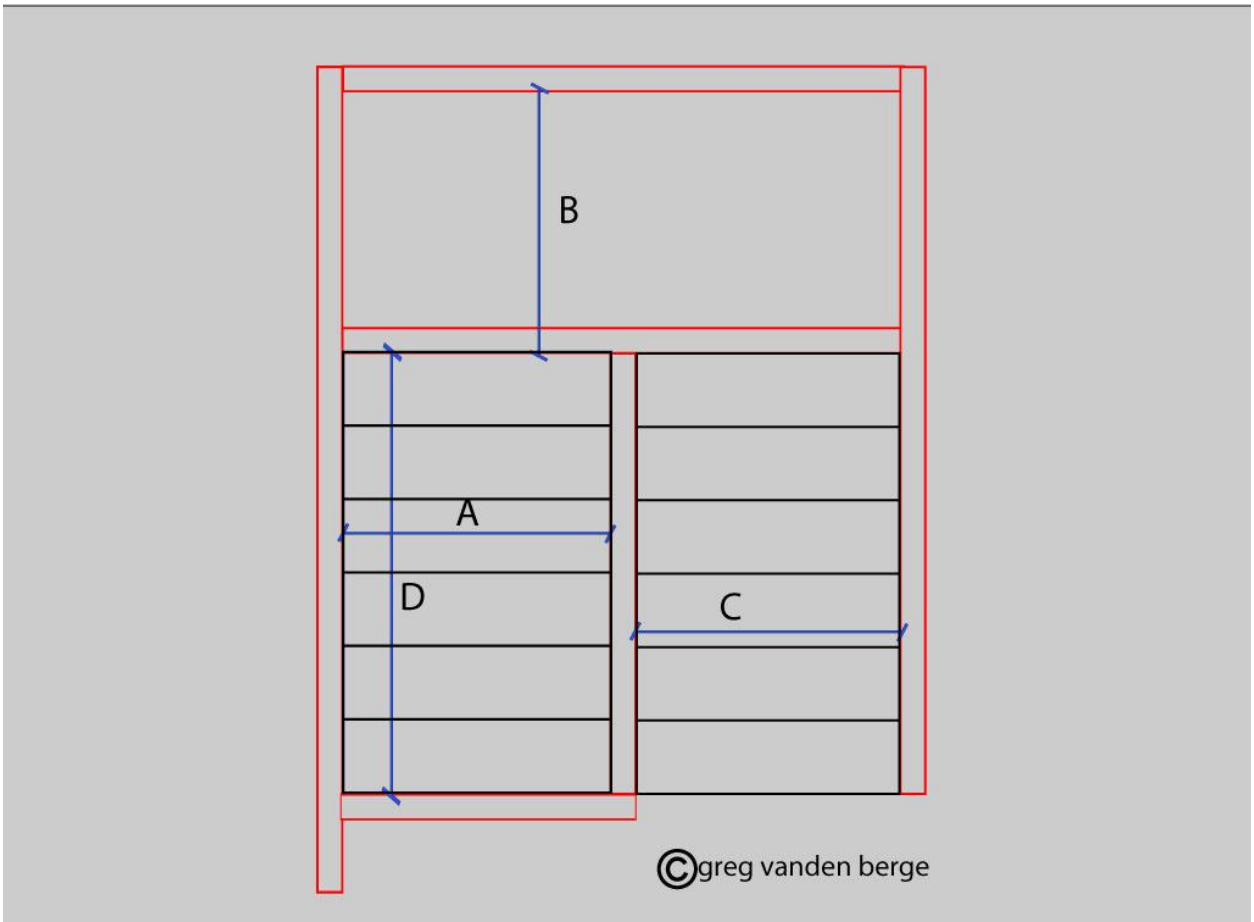
In the illustration above measurement C provides us with the width of the lower stairway. The lower stairway will actually butt up against the middle wall and extend over the outer one.



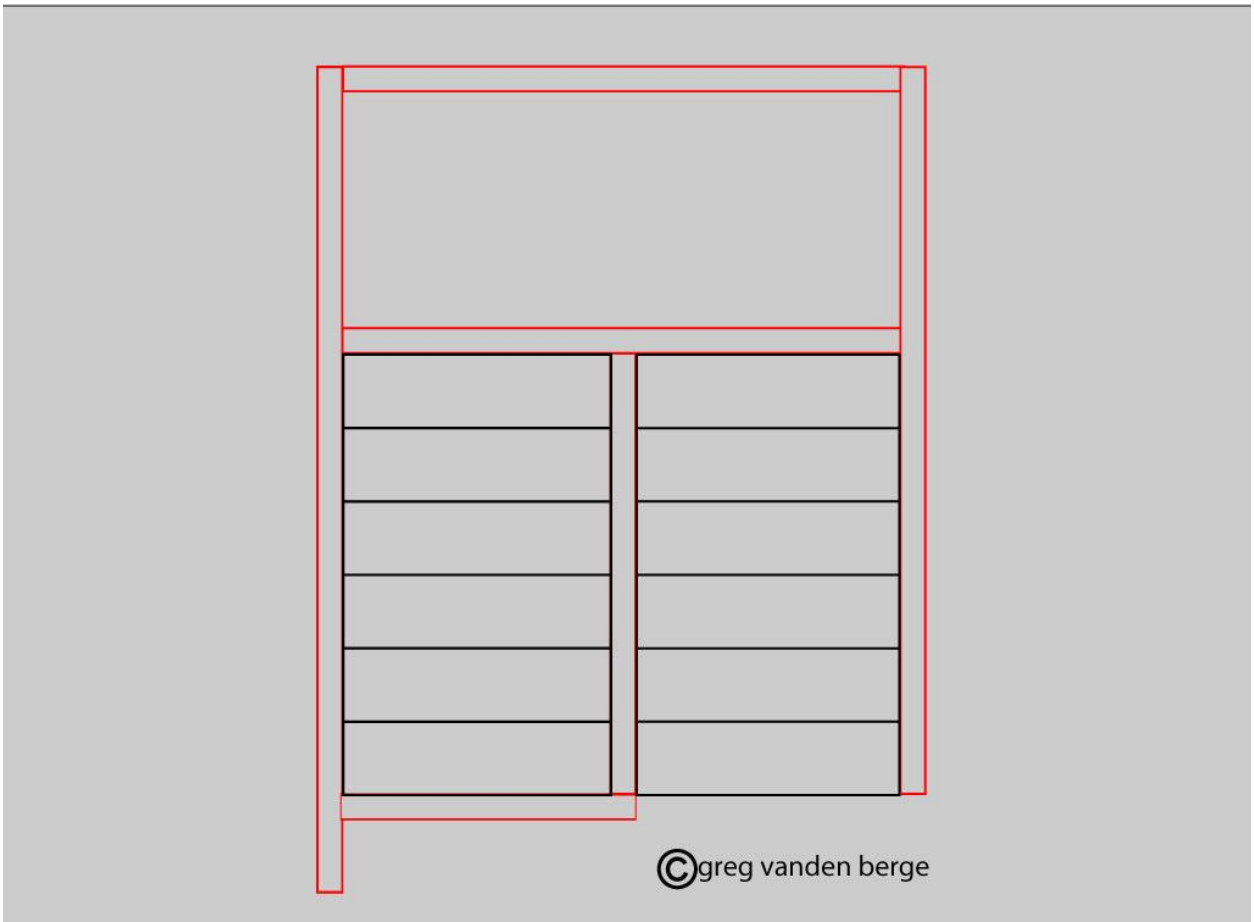
In this illustration you can clearly see both the upper and lower stairs positioned over the outer walls. The upper stairway butts up against the wall on the left side of the illustration, just like the lower one.



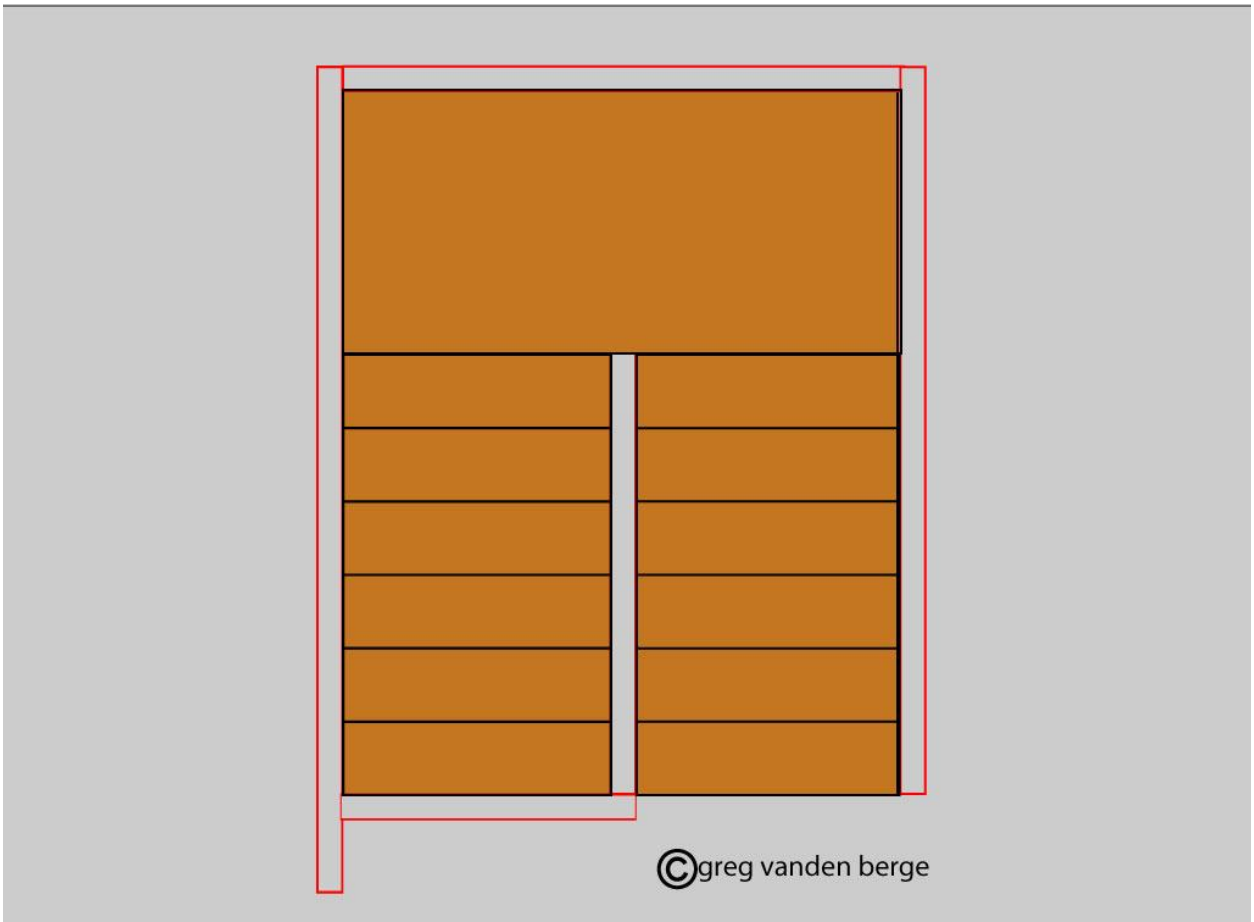
Here's what the floor plan would look like if both stairways were removed and placed on each side. Again, there will be illustrations like this through out the book, to give you a better idea, why you're doing, what you need to do.



In this illustration both the upper and lower stairs will be positioned between the walls. You can always mix these designs together and have the upper stairway sitting on top of a wall, while the lower stairway sits in between two walls or vice versa.



Here's what the stairway floor plan would look like without any measurement marks.



Here's what the stairway would look like, without any measurement marks and each step positioned properly, along with the landing.

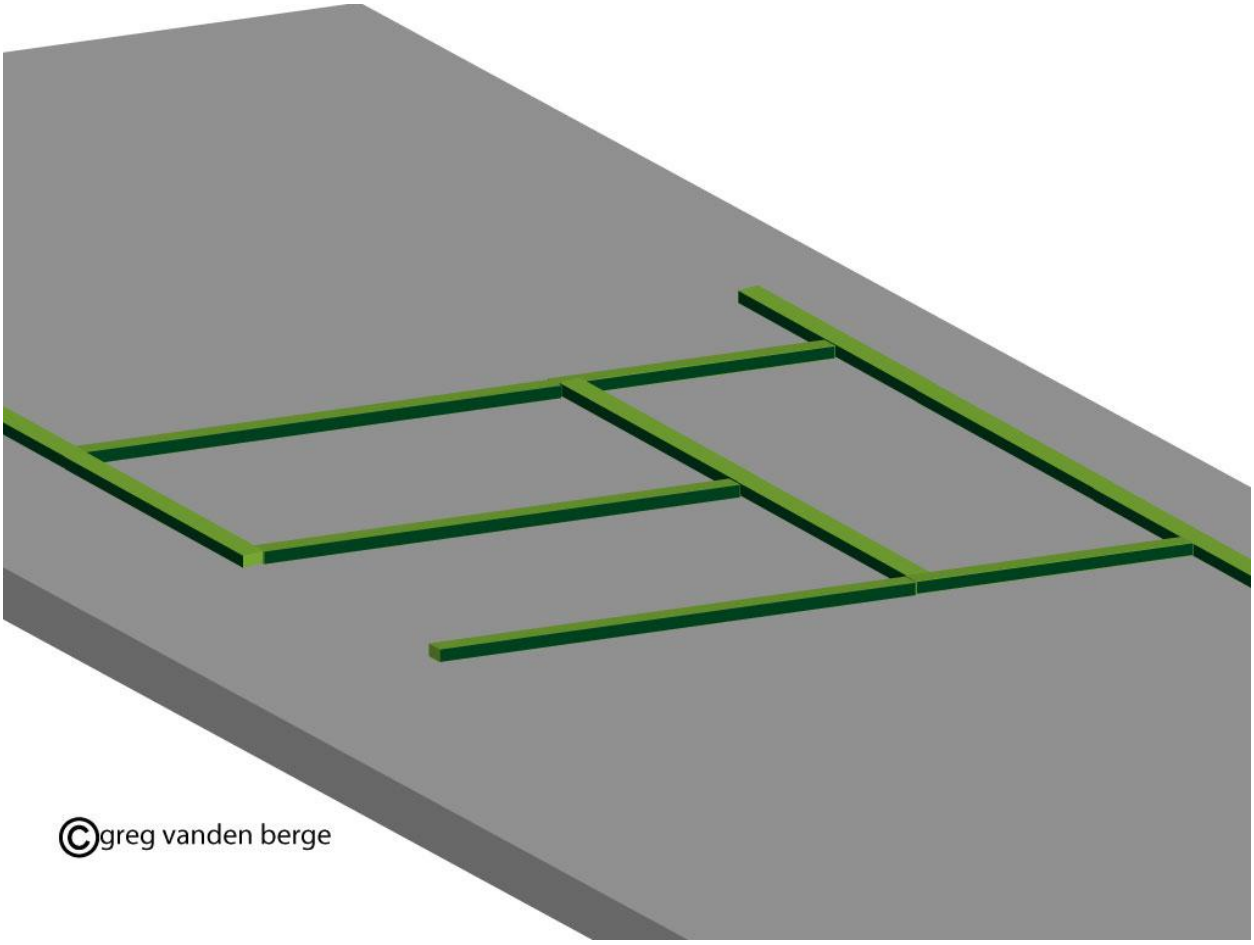
In order to build a stairway where each step is positioned correctly, you will need to learn how to position the stair stringers precisely.

This is probably one of the biggest problems new stair builders and even experienced carpenters deal with.

For more information, feel free to skip ahead to the chapter on Horizontal Landing Locations

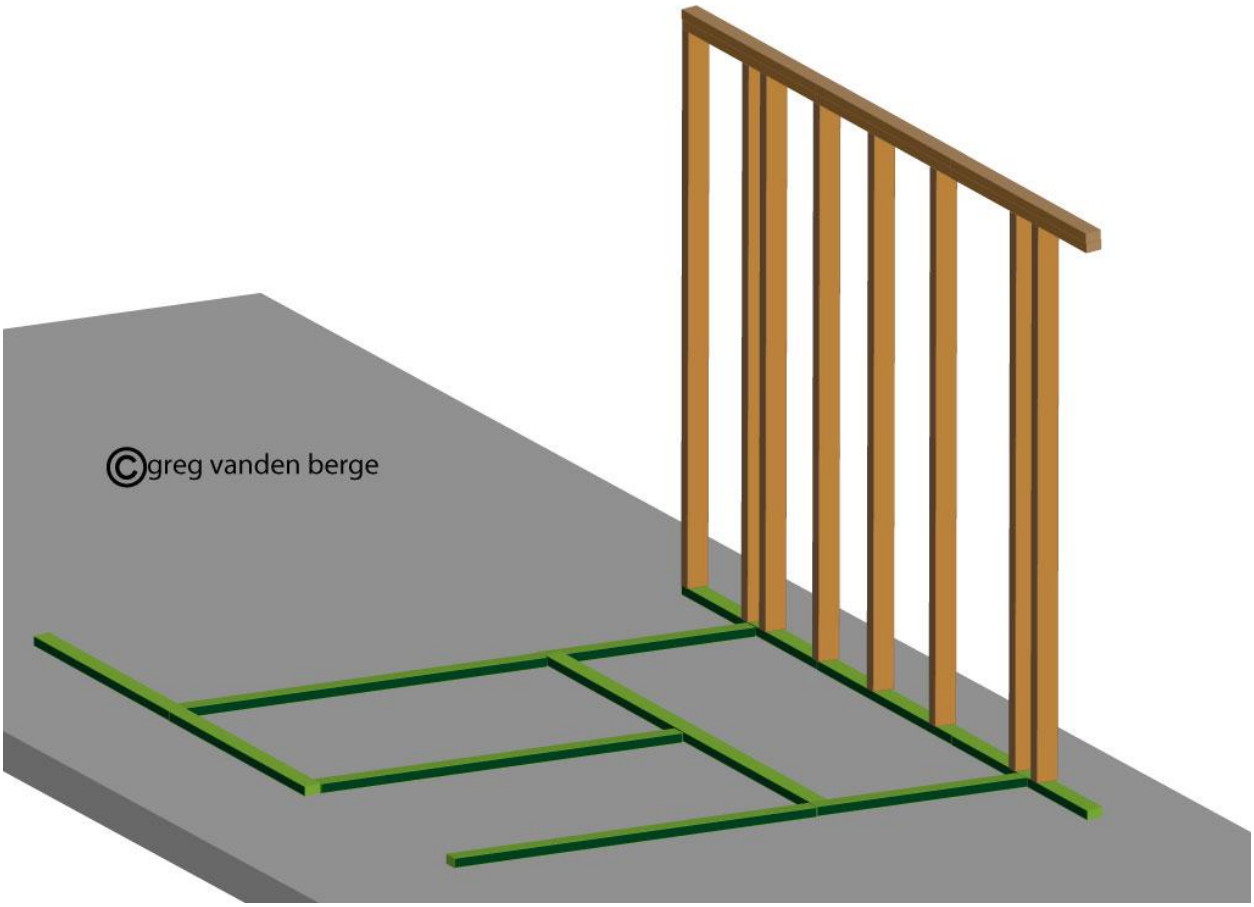
Building The Stairs

In this chapter I'm going to use three-dimensional illustrations to provide you with a better example and crystal clear illustrations of how this particular stairway can be built.



Step 1: After you marked out and positioned each wall perfectly, you can cut the bottom plates and place them exactly where they need to go.

I'm not going to go into detail on how these framing plates need to be attached to the building foundation, because that would require another book. Feel free to attach bottom wall plates using standard construction methods.

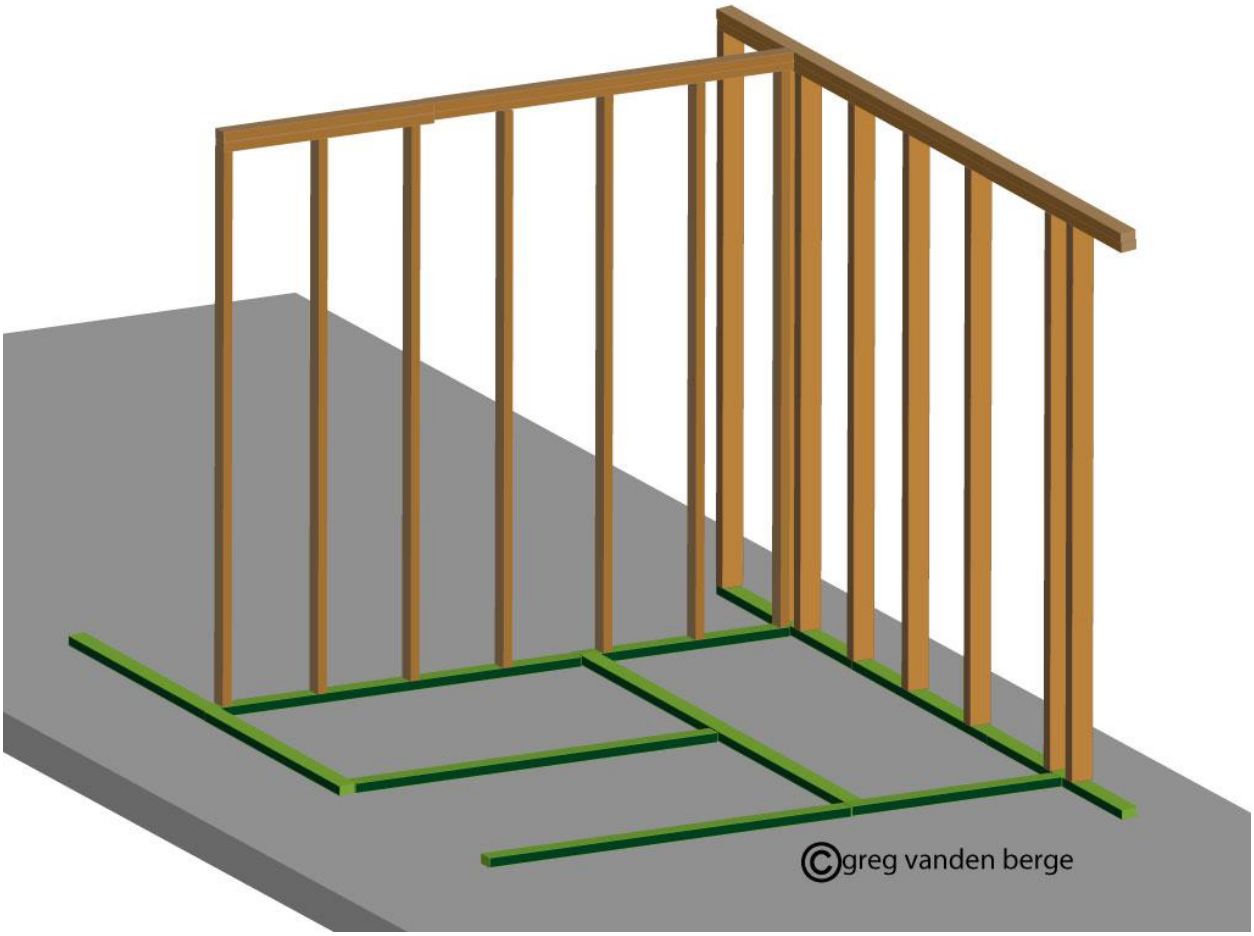


Step 2: Frame the back wall, using precut wall studs.

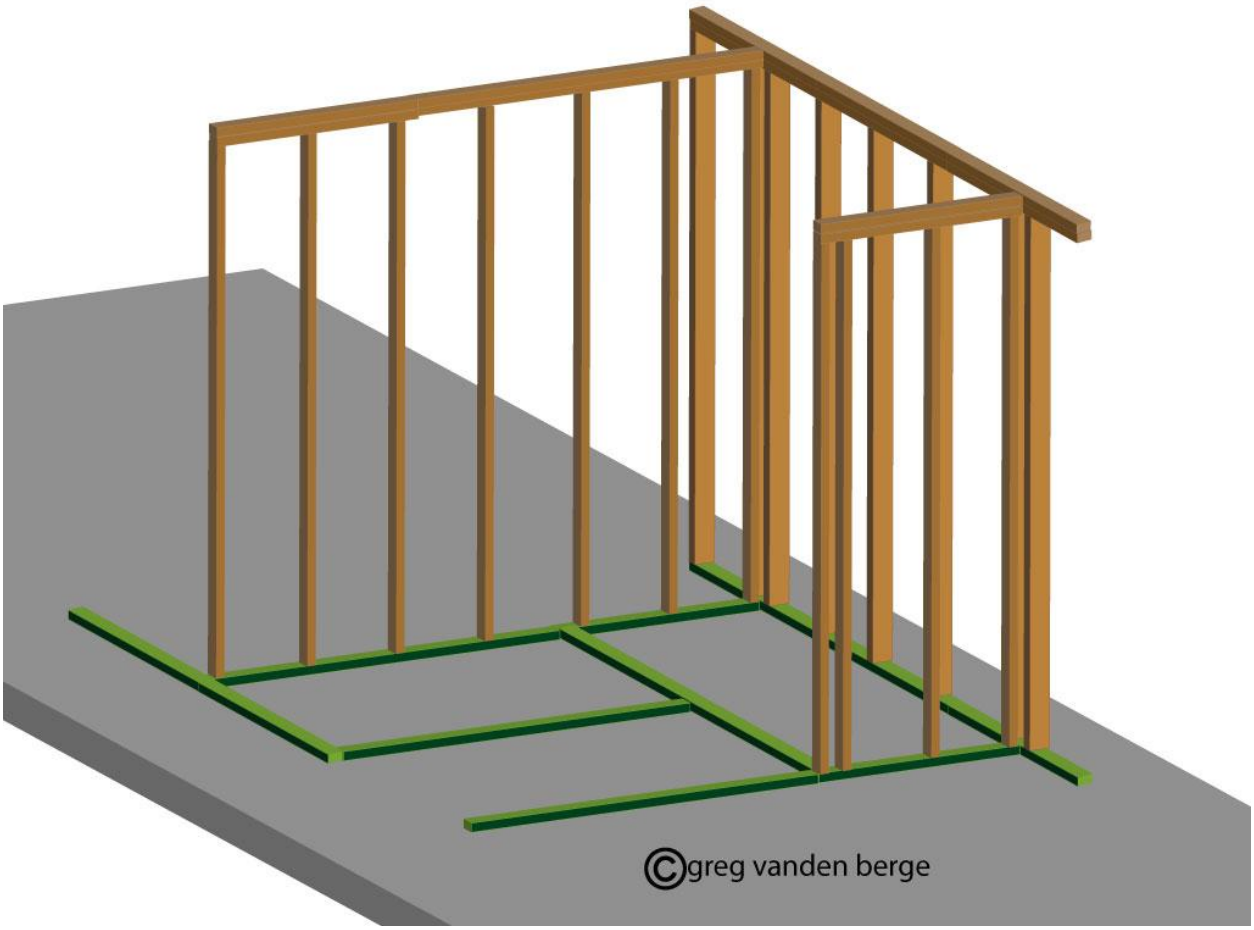
A standard wall stud for an 8 foot ceiling is 92 1/4 inches.

A standard wall stud for a 9 foot ceiling is 104 1/4 inches.

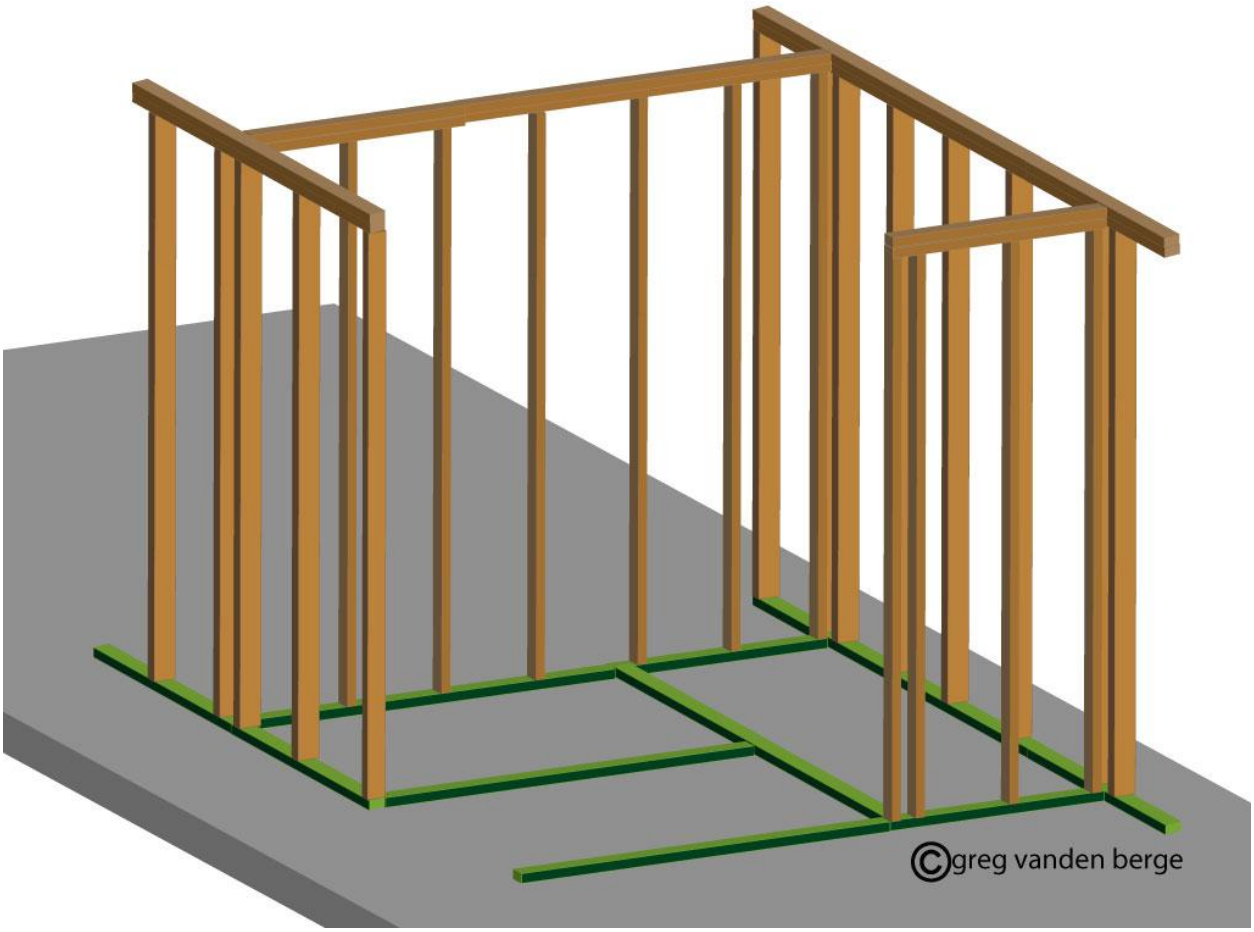
We will be using 88 1/4 inch wall studs for our example and this would not be recommended nor is it common construction practice. It just works well with our 7 1/2 inch riser measurement.



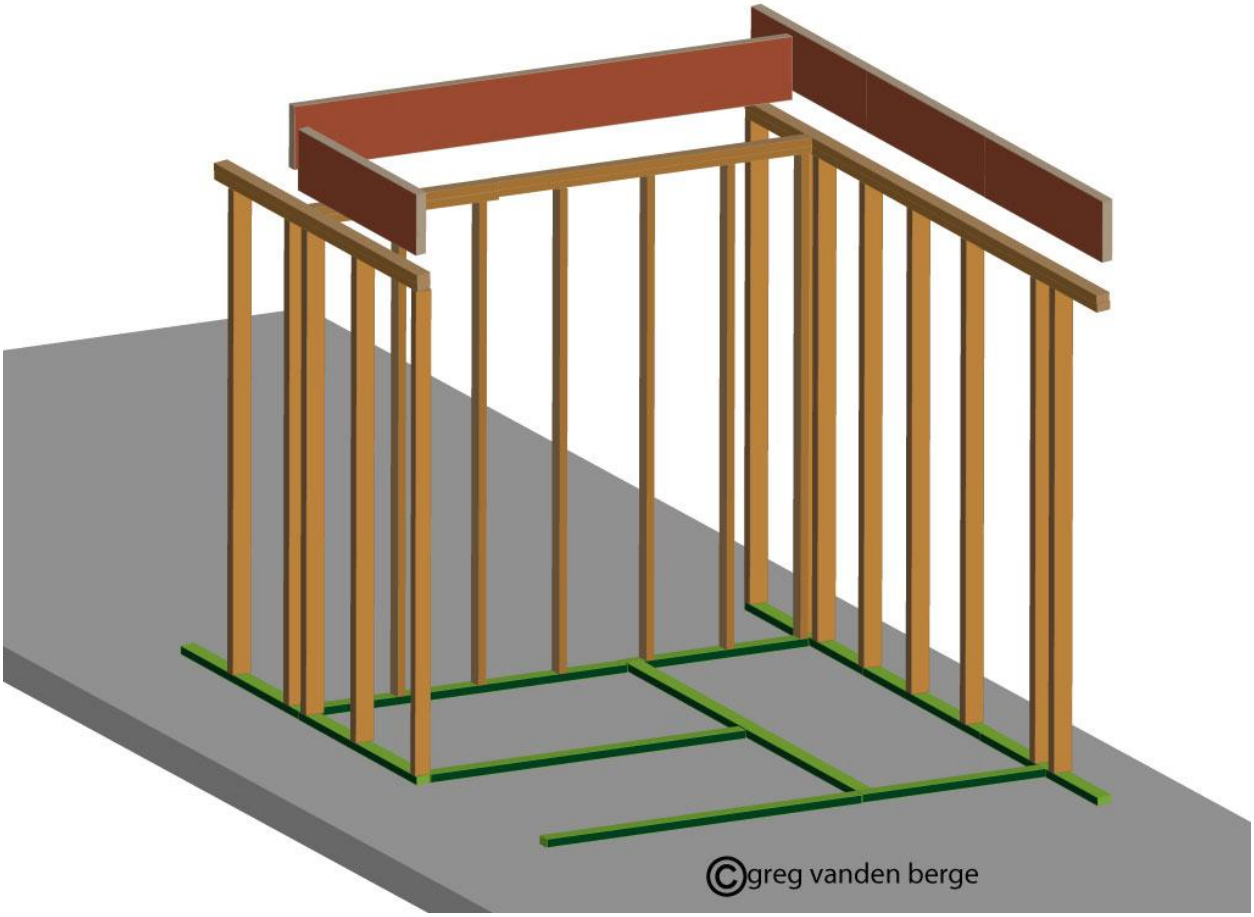
Step 3: In the next step we will frame the inside wall.



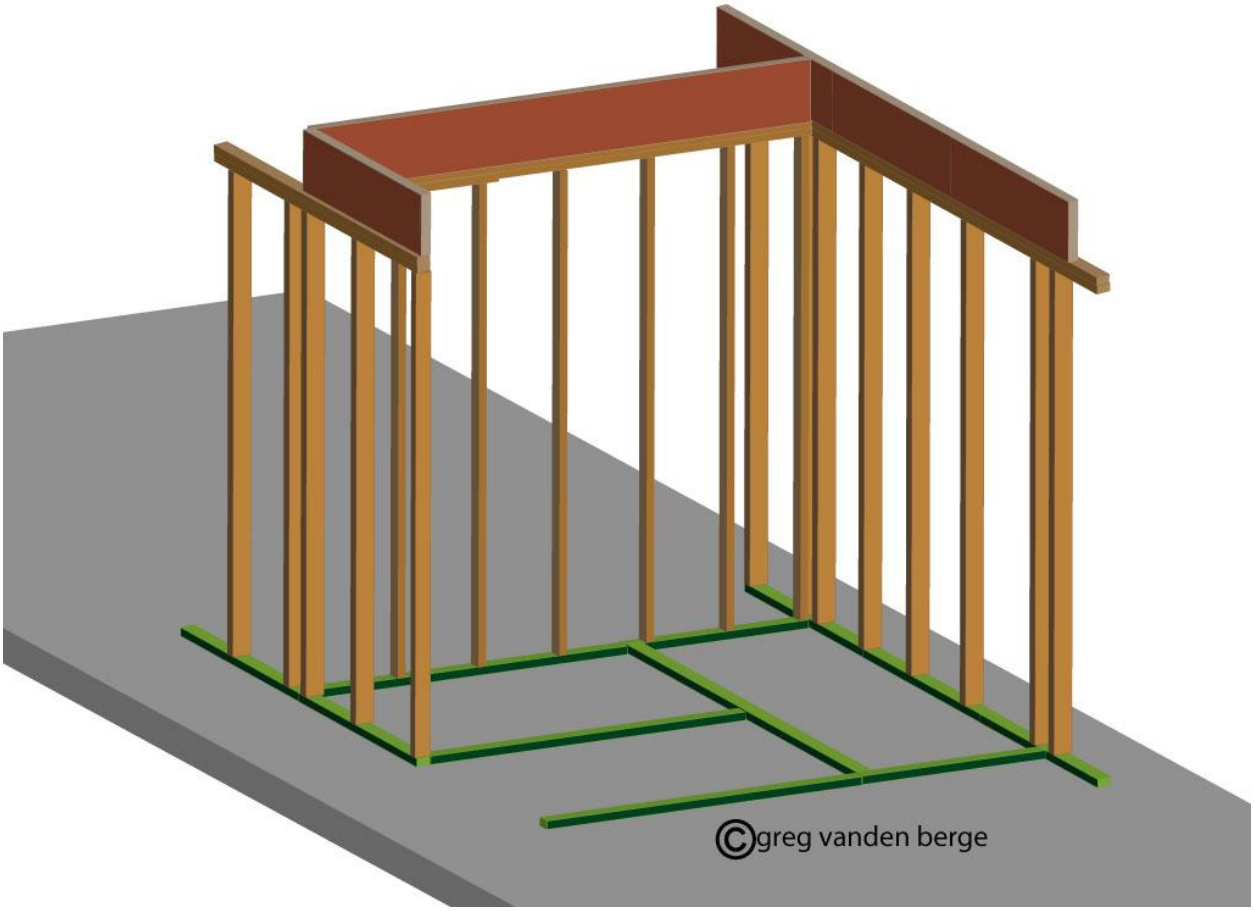
Step 4: In the next step we will frame the outer wall. However, we will remove it later to provide you with an unobstructed view of the landing and provide you with another way to frame this wall.



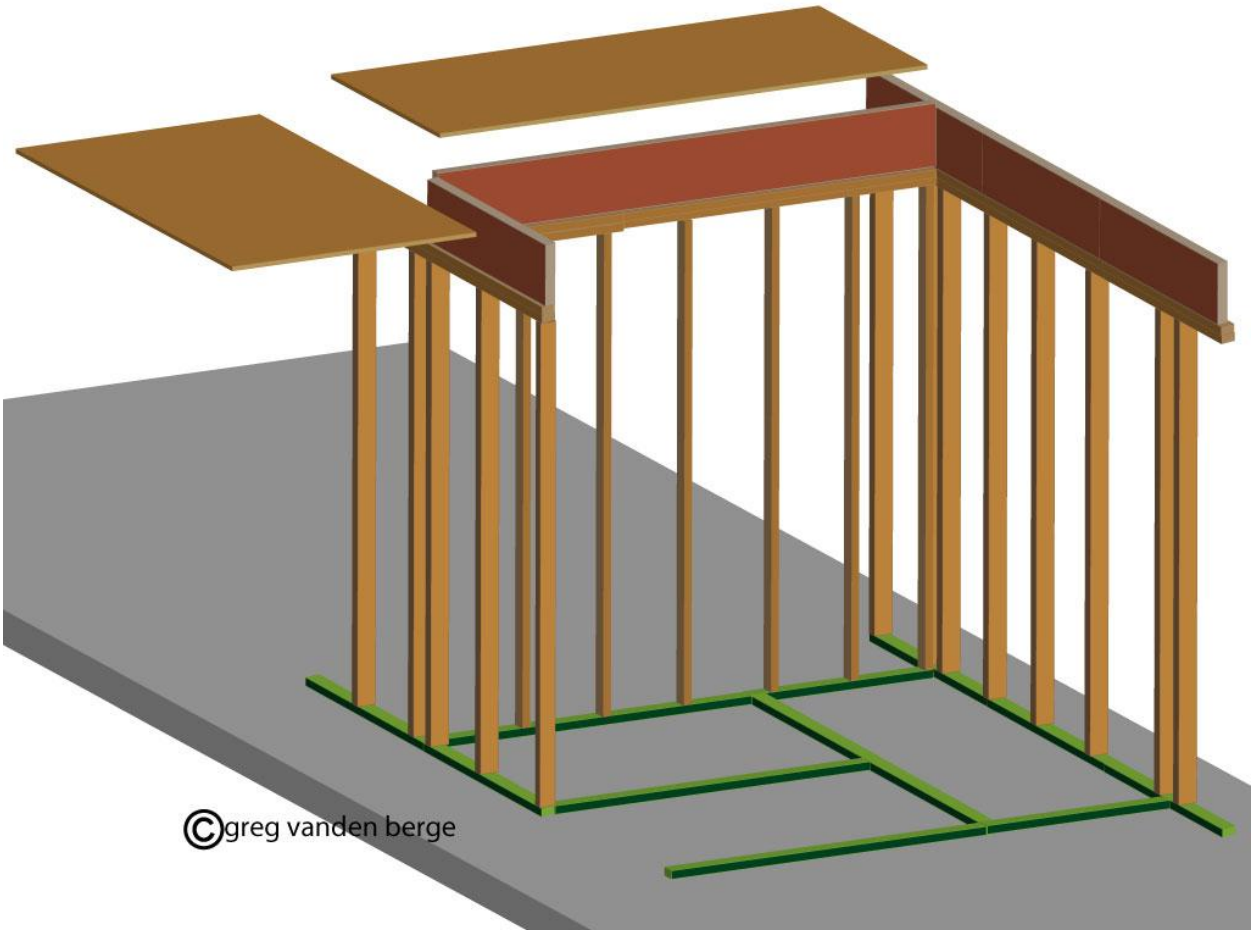
Step 5: In the next step we will frame the wall where the stairs meet with the upper floor.



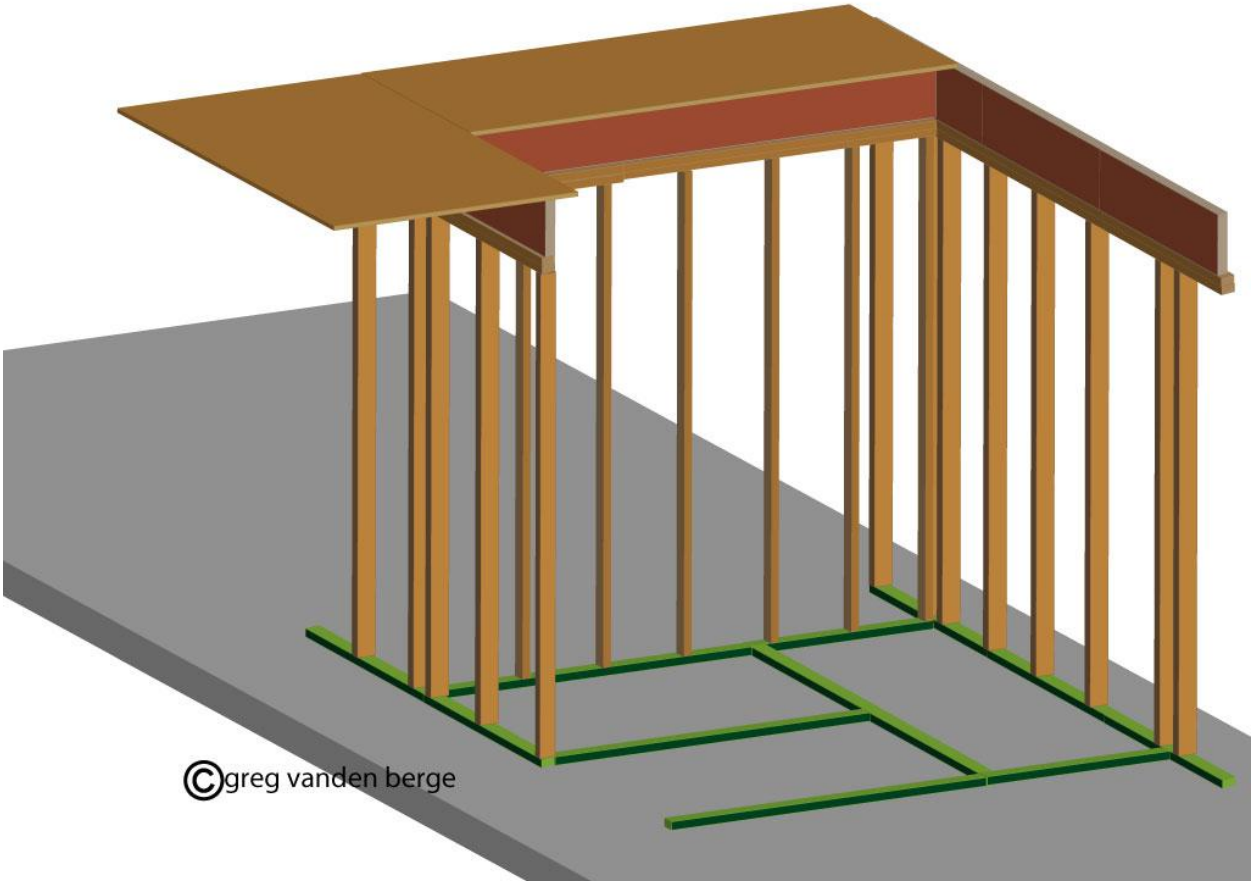
Step 6: In the next step we will place a few floor joists on top of the walls we built, in order to provide us with something that will represent the upper floor. If you also notice I removed the outer wall, in order to provide you with a better view, of the stairway construction process.



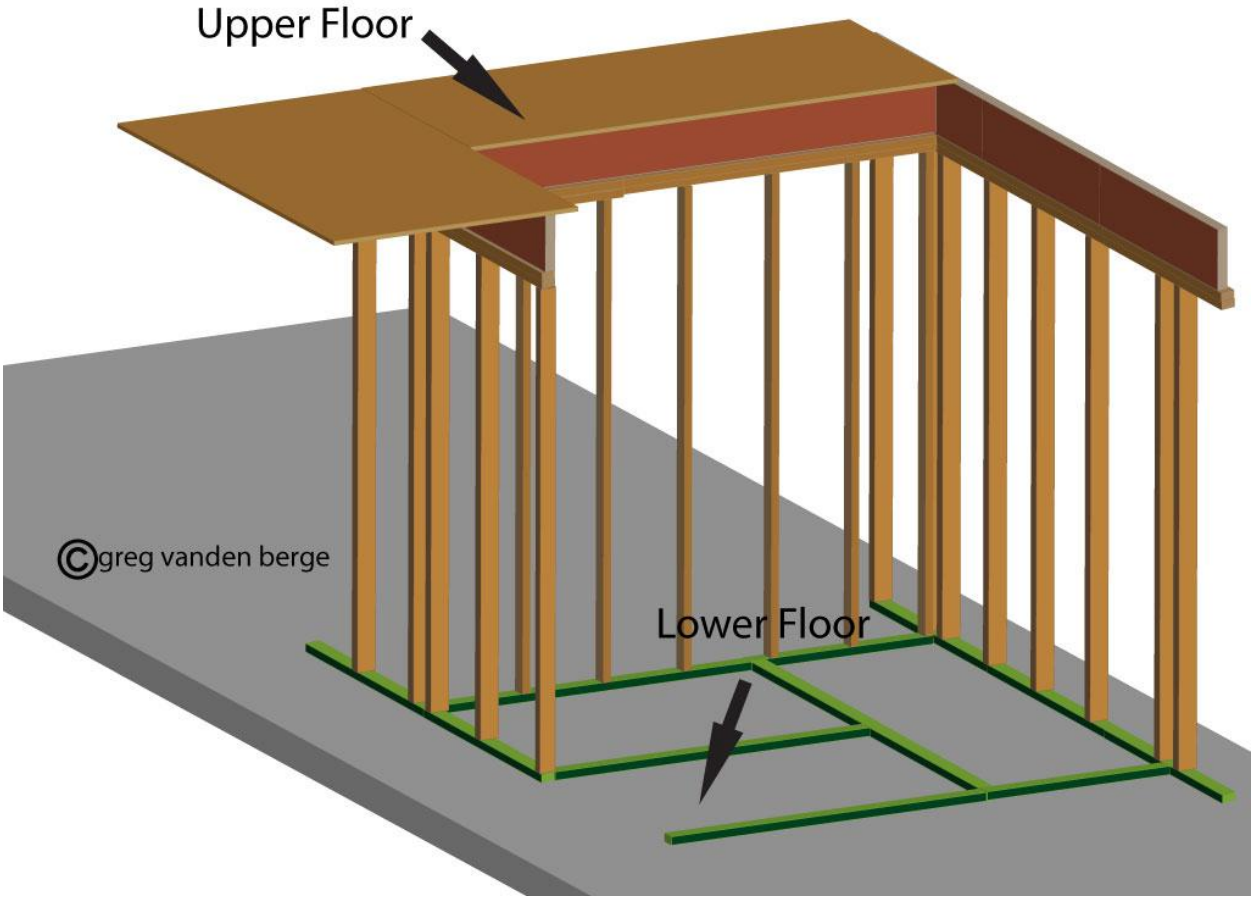
Step 7: After the 2 x 12 floor joists have been positioned properly, then the process of framing the lower stairwell would have been completed.



Step 8: In the next step we will place two pieces of plywood on top of the floor joist to represent the upper floor.



Step 9: You can use your imagination, to imagine additional floor joists underneath the plywood, but it won't be necessary. We don't need anything distracting us from the task ahead or blocking any part of the illustration.



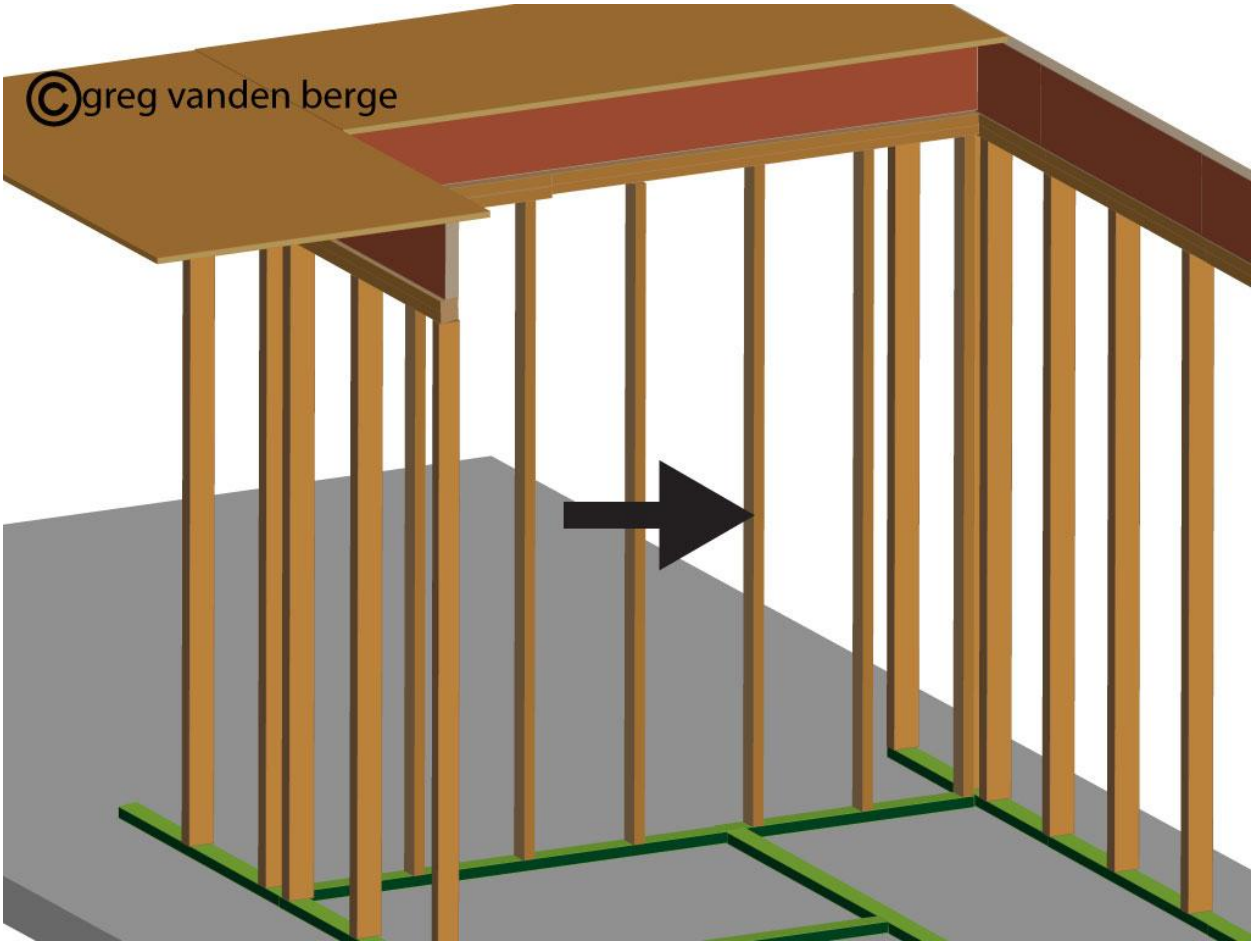
Step 10: The bottom arrow is pointing to the lower floor and the upper arrow is pointing to the upper floor. Now would be a good time to double check the overall rise of the stairway to make sure it's still the same.

It isn't uncommon to see these measurements increase or decrease an eighth of an inch, quarter of an inch or even a half inch under certain circumstances.

It's always a good idea to layout your stringers after the walls and floor have been framed, just in case you end up with a different total overall rise.

However, at this point it would be difficult to move any walls you framed, so it wouldn't be a bad idea to double check any measurements that will affect the stair framing, before you actually build the walls.

At this point, any wall that wasn't framed could still be moved, if needed.



Step 11: In this step we will figure out exactly where to position the top of the stair landing. The first thing we need to do is figure out the total amount of risers, the lower section of the stairway has and then multiply that number by the individual riser measurement.

For example: We have seven risers below the landing. We will simply multiply the seven risers by 71/2 inches, giving us a total landing height from the lower floor of 52 1/2 inches.

7 x 7.5 = 52.5

7 (amount of risers) x 7.5 (individual riser measurement) = 52.5

Now it wouldn't be a bad idea to grab a tape measure and measure from the lower floor and mark the overall landing height on one of the wall studs. This way you have a good idea, where the top of the landing should finish.

Next we will subtract the landing sheathing thickness, landing joist height and wall framing plates from our overall landing height measurement, in order to figure out exactly how long we should cut our landing wall studs.

In our example we're going to use 3/4" plywood to sheath the landing = .75 inches

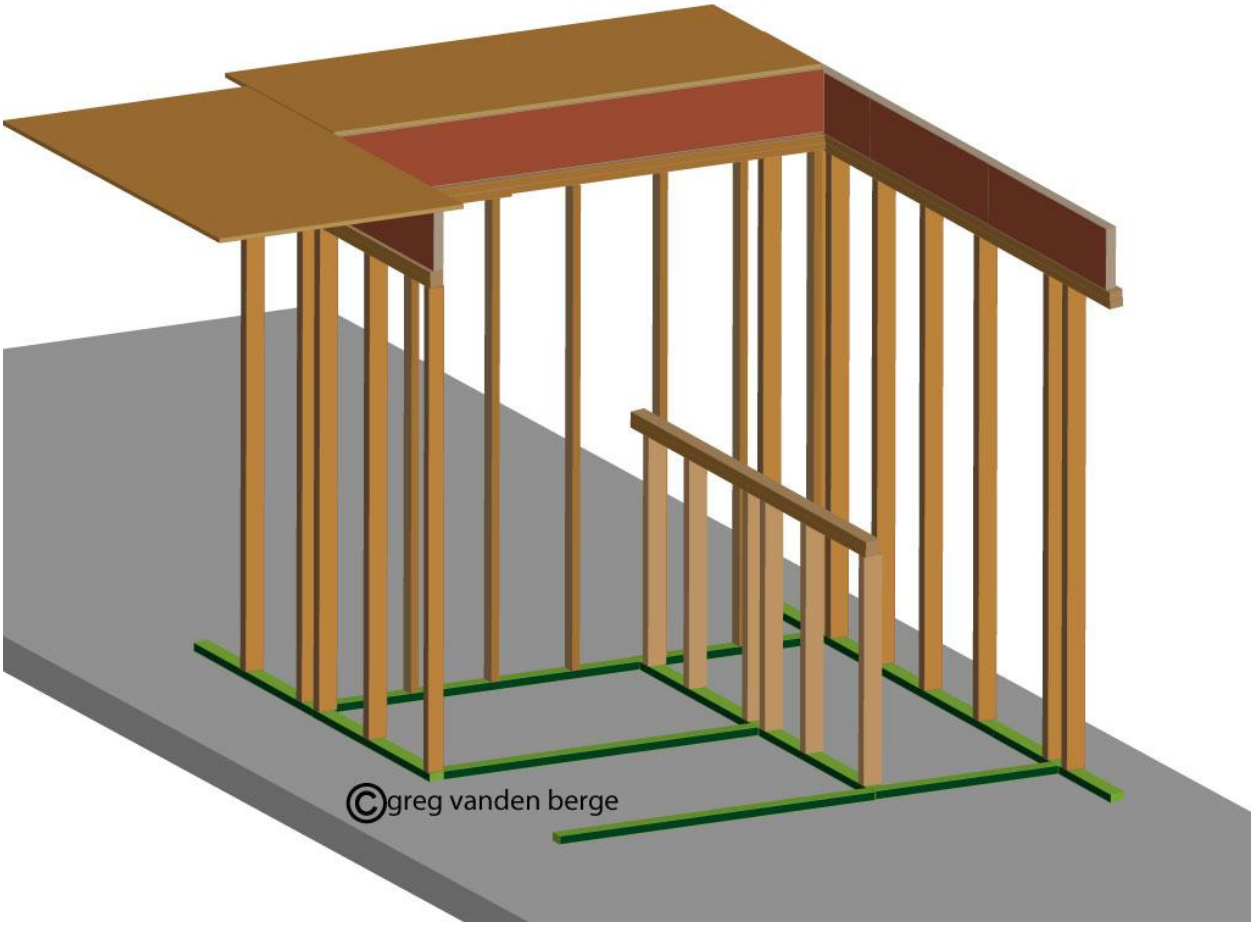
Along with 2 x 6 landing joist = 5.5 inches

And last but not least a lower 2 x 4 framing plate and two 2 x 4 upper framing plates that are an inch and a half each if measured vertically = 4.5 inches

Overall landing height	52.5
3/4" Plywood	- .75
2 x 6 Landing joist	- 5.5
3 - Framing plates	- 4.5
Landing wall stud	41.75 inches

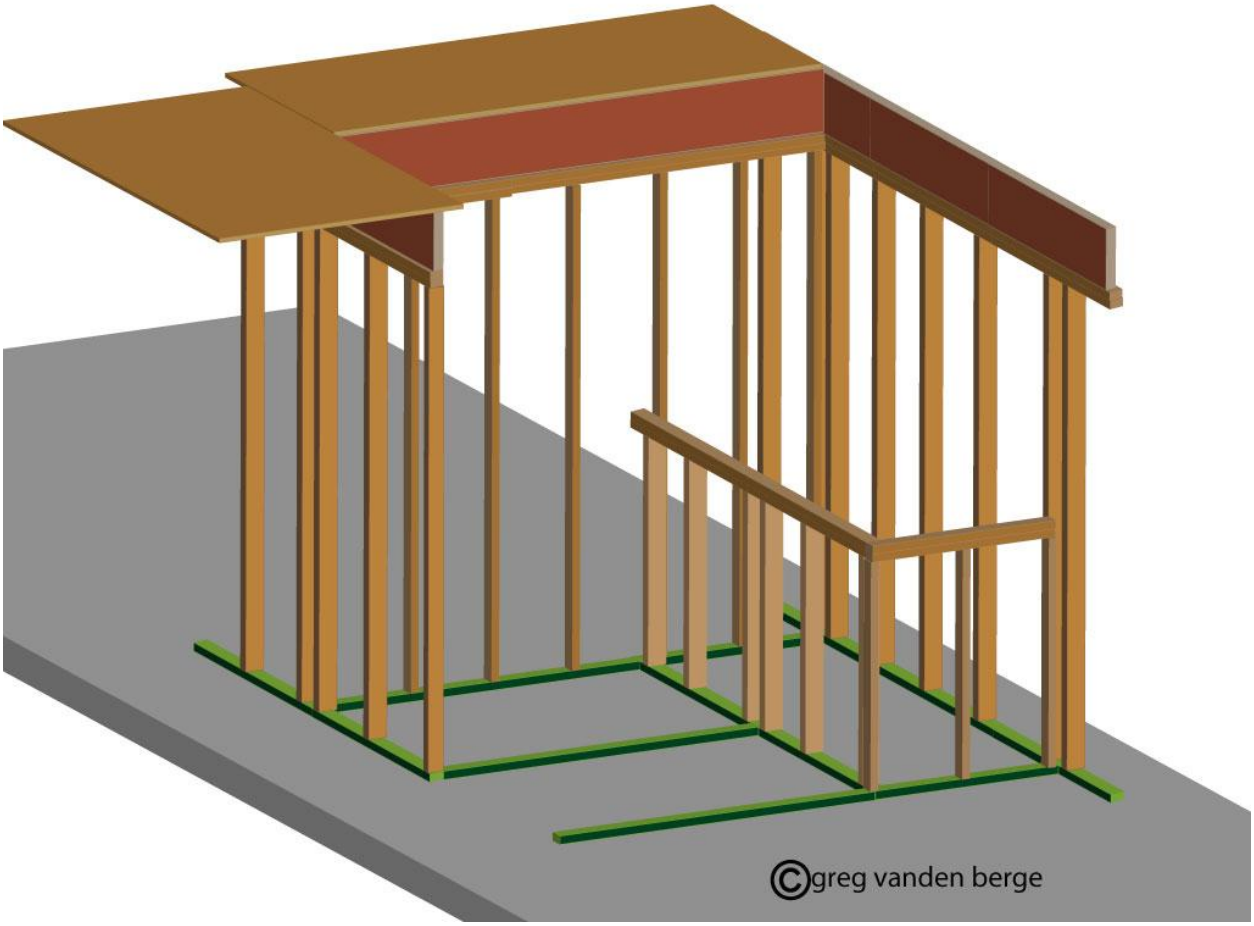
Then it wouldn't be a bad idea to subtract another quarter of an inch off of this measurement, to allow for additional variations in the lumber.

The total height for your landing wall studs should be 41 1/2 inches.



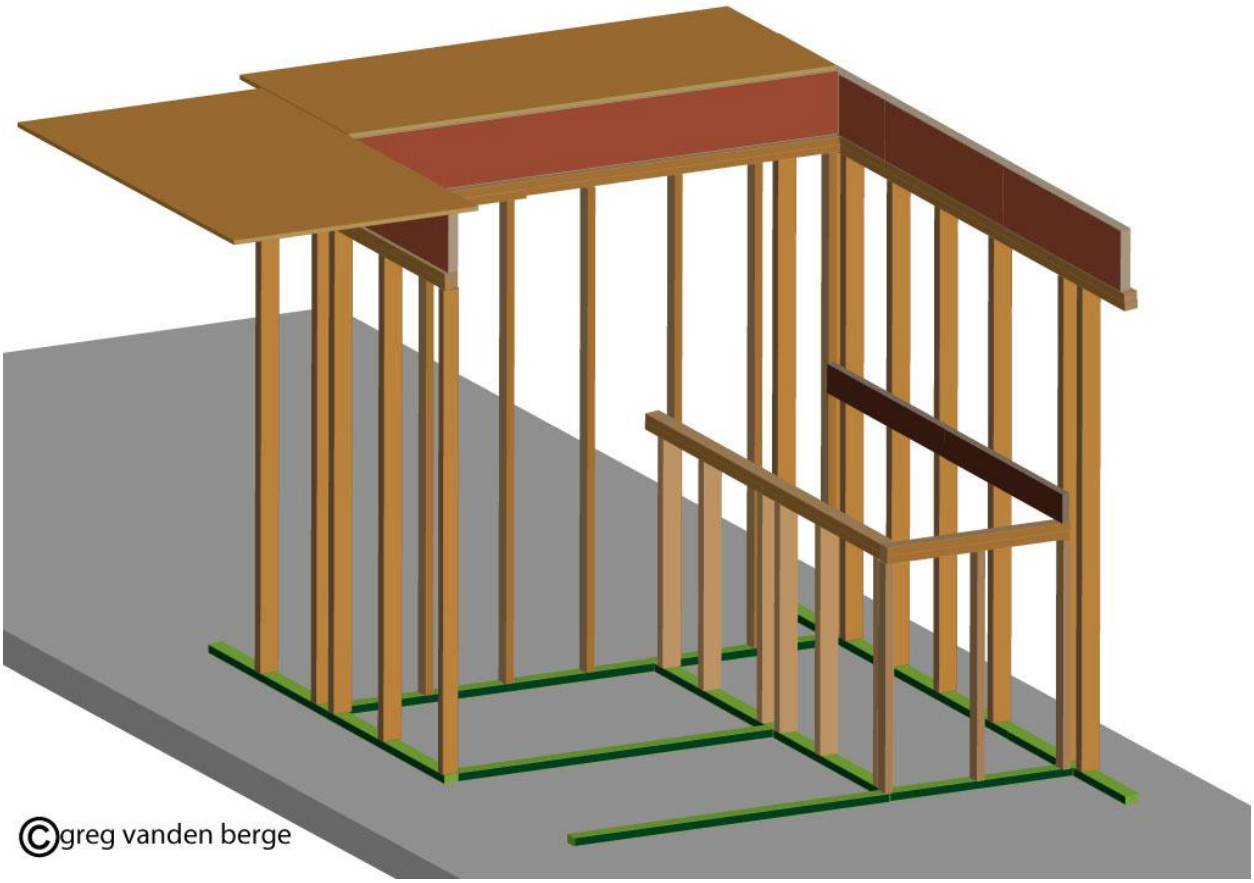
Step 12: The next step will be to cut your landing wall studs, top plates and frame the wall. After the wall is framed, it wouldn't be a bad idea to verify the height. Grab a scrap piece of 2 x 6 and place it on top of the landing wall and then place a scrap piece of 3/4" plywood on top of that, to see if it lines up with the overall measurement mark you made on the wall studs.

You can also place a piece of 2 x 6 and scrap piece of 3/4" material on top of the wall and measure from the floor to the top of the 3/4" material that would represent the top of your landing, to double check these measurements.



Step 13: In step number 13 were going to do something a little different, to provide you with another way to frame your landing. Remember in one of the previous steps we removed the outer wall we framed, in order to provide us with a better view of the construction process.

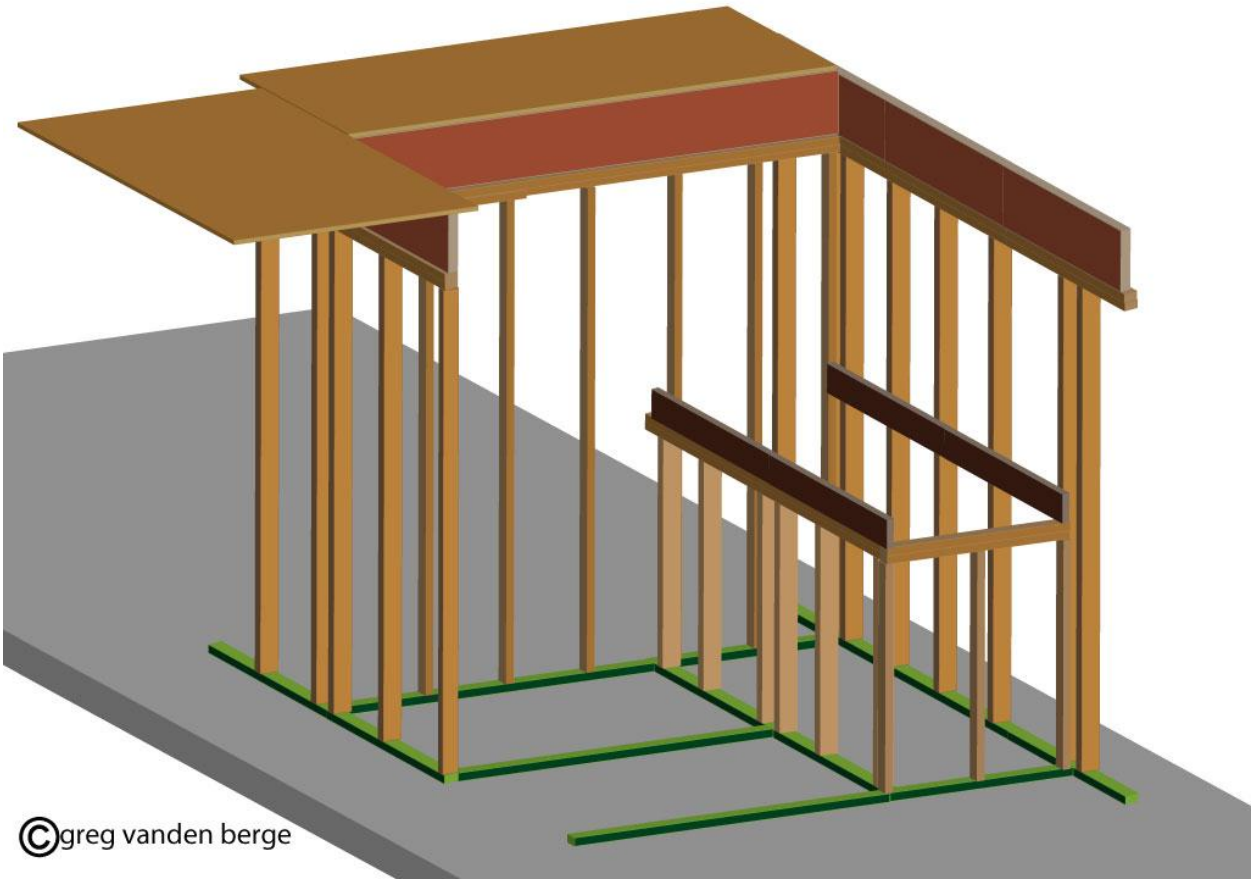
We're going to leave that wall out, even though I would like you to keep that particular method for building stairs in the back of your mind. Both methods can be used to create a different stair design.



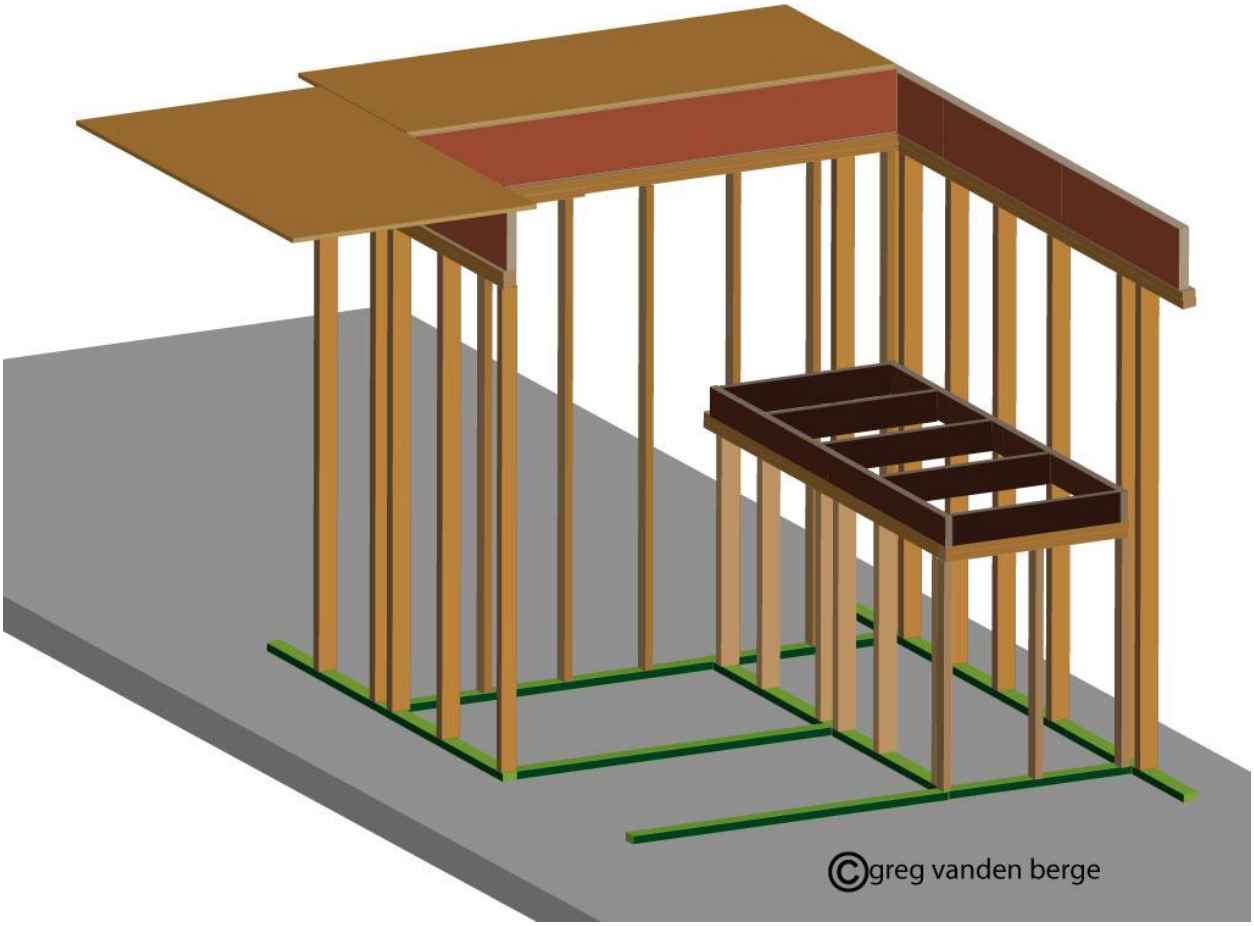
Step 14: In the next step we will attach the 2 x 6 landing ledger to the wall. You can use a level to mark the bottom of the ledger, on either one of the corner wall studs or simply measure the height of the landing wall and transfer this measurement to the back corner.

It wouldn't be a bad idea to drive one nail through the ledger, into one of the wall studs and then place a level on top of the ledger, to make sure it isn't out of level. If it is, then feel free to make the necessary adjustments.

It also wouldn't be a bad idea to check the top of the landing walls, in order to see if everything is level. It's a lot easier to make adjustments throughout any part of the stair building process, if you haven't nailed everything off.



Step 15: In the next step you can attach the front landing rim joist, by toe nailing it in to the landing wall top plate.

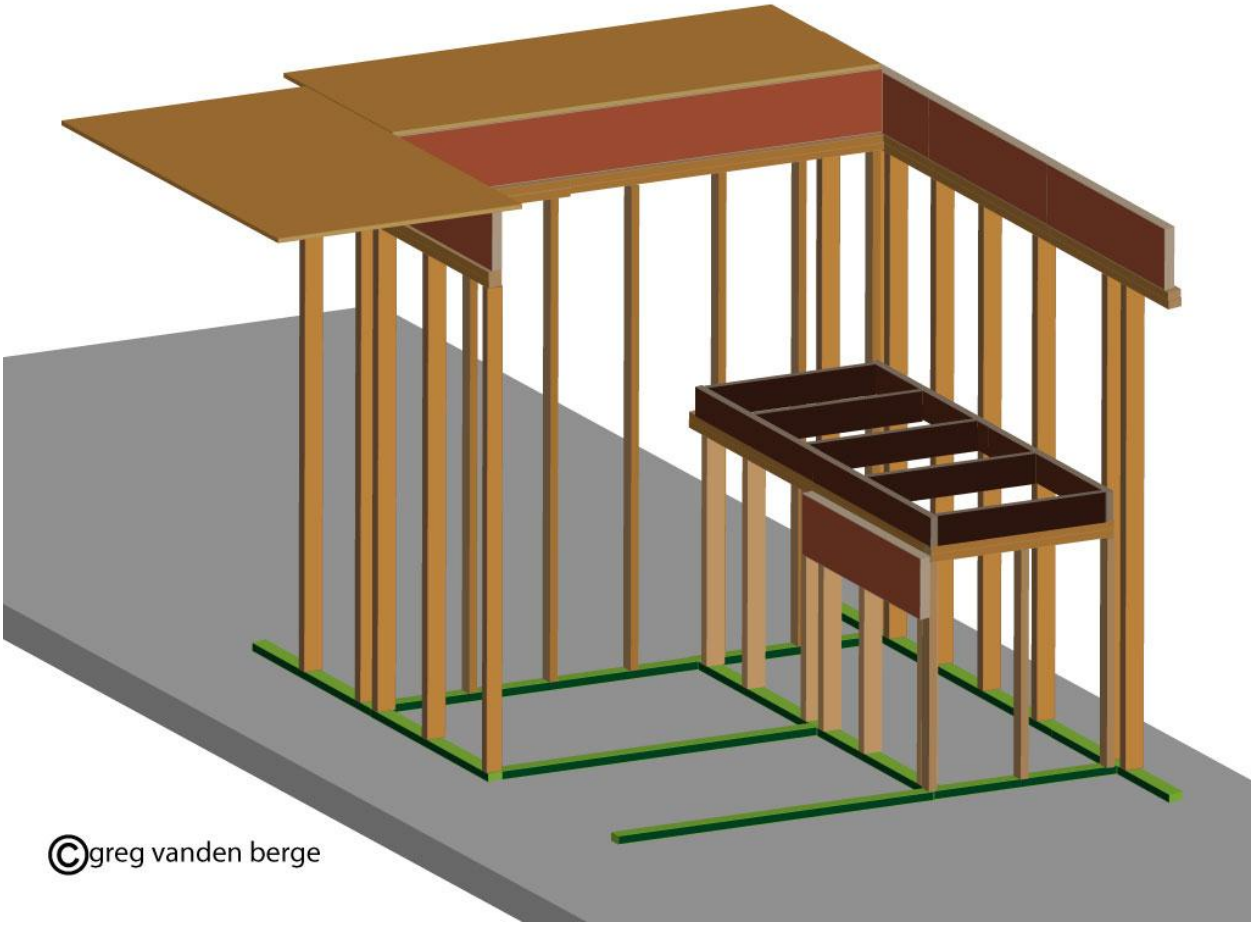


Step 16: After you've double checked your measurements and whether or not the landing is level, feel free to cut and install the landing joist. It wouldn't be a bad idea to place the landing joist 16 inches on center or equally space them, according to the overall length of the landing, without exceeding construction building standard layout measurements.

The distance you place each individual joist away from the other one will be determined by sheathing material thickness. The examples below wouldn't apply to every situation or stair design, but will give you a good idea.

For example: If I was going to use 3/4" plywood then I wouldn't want more than 14 1/2 inches in between each joist, providing me with a 16 inch on center landing joist layout.

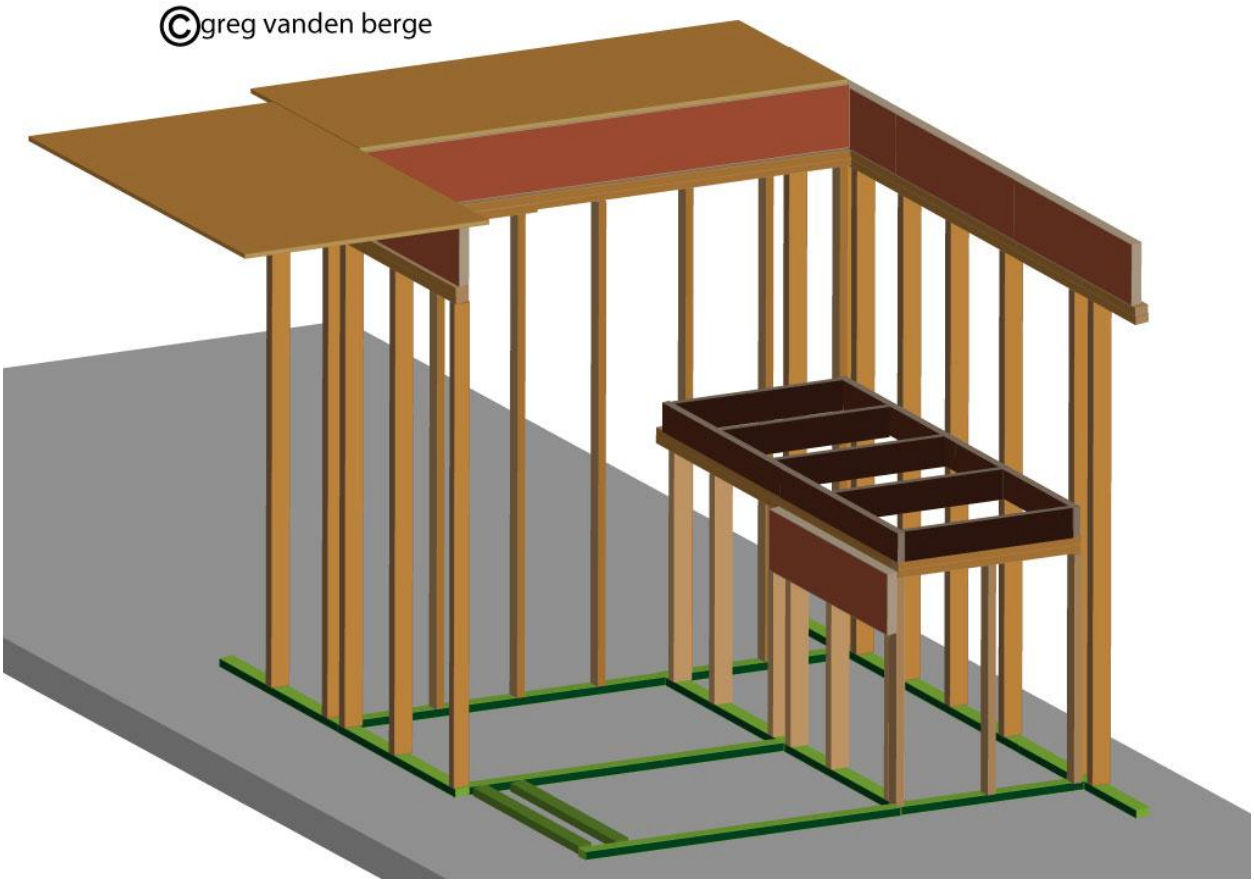
However, if I was going to sheath the landing with 1-1/8 inch plywood or even 2 x 6 decking, I could space them 24 inches on center, providing me with a 22 1/2 inch space in between each one.



Step 17: In this step we will cut and install the lower stair ledger. As long as the landing sheathing thickness is the same as the thickness of each stair tread, you can position the ledger the same distance as the individual riser height, from the top of the landing joist.

For example: If the stair riser height is 7 1/2 inches then simply measure from the top of the landing joist down and make a mark at 7 1/2 inches on each side of the landing wall. Then you can cut a 2 x 10 or 2 x 12 ledger the width of the stairway and attach it to the landing framing.

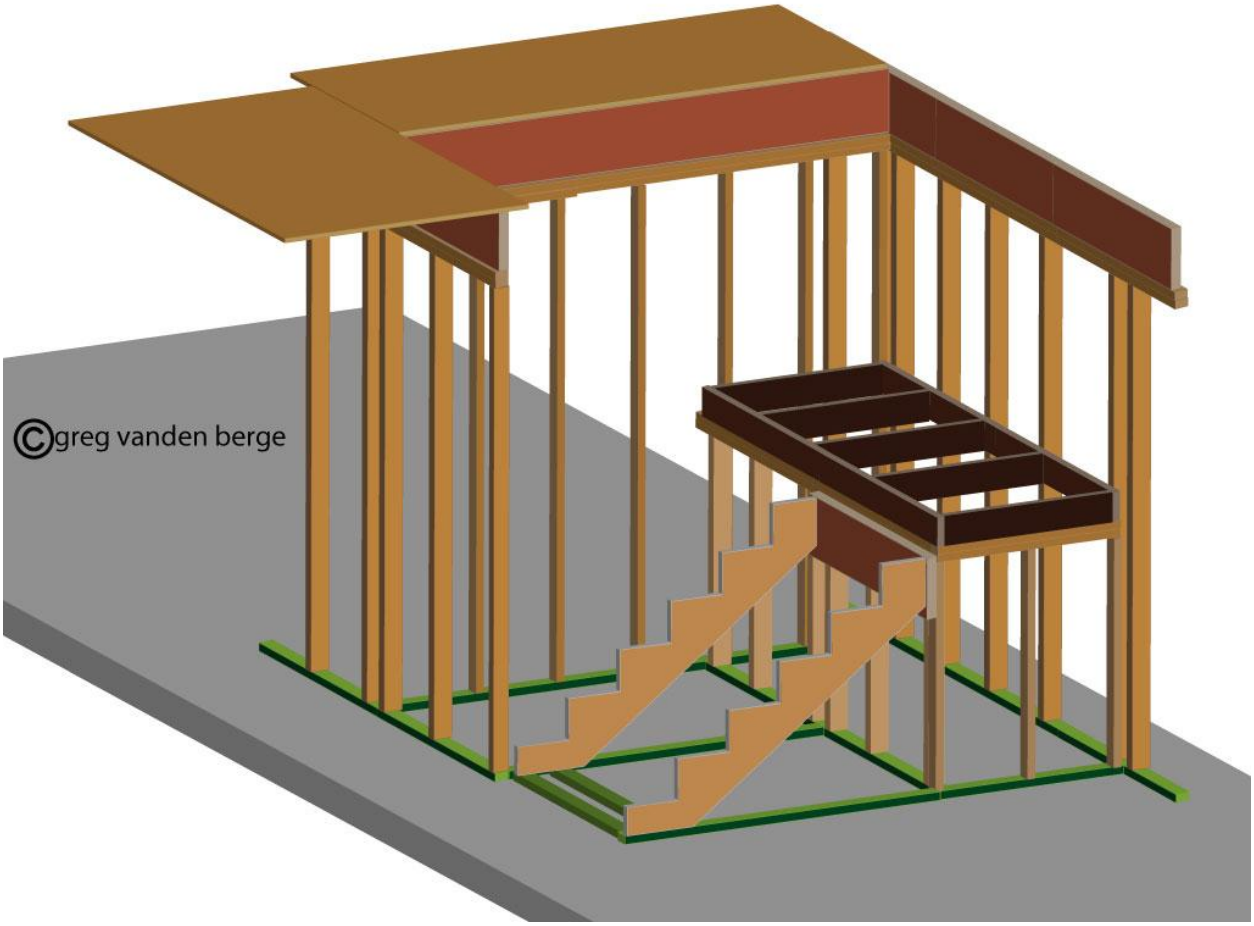
If the landing sheathing or stair tread thickness is different then you will need to either move the ledger up or down, to adjust for the difference.



Step 18: Next you will need to cut two bottom plates out of treated material, if they are going to sit directly on top of concrete. If you're building a set of stairs on top of a wood floor then any construction standard material will do fine and you won't need to use treated lumber.

Do not attach these bottom plates to a concrete foundation until you have positioned the stair stringers and double checked their location.

http://www.pic.stairs4u.com/splitlevel/stair_stringer_ledger.htm



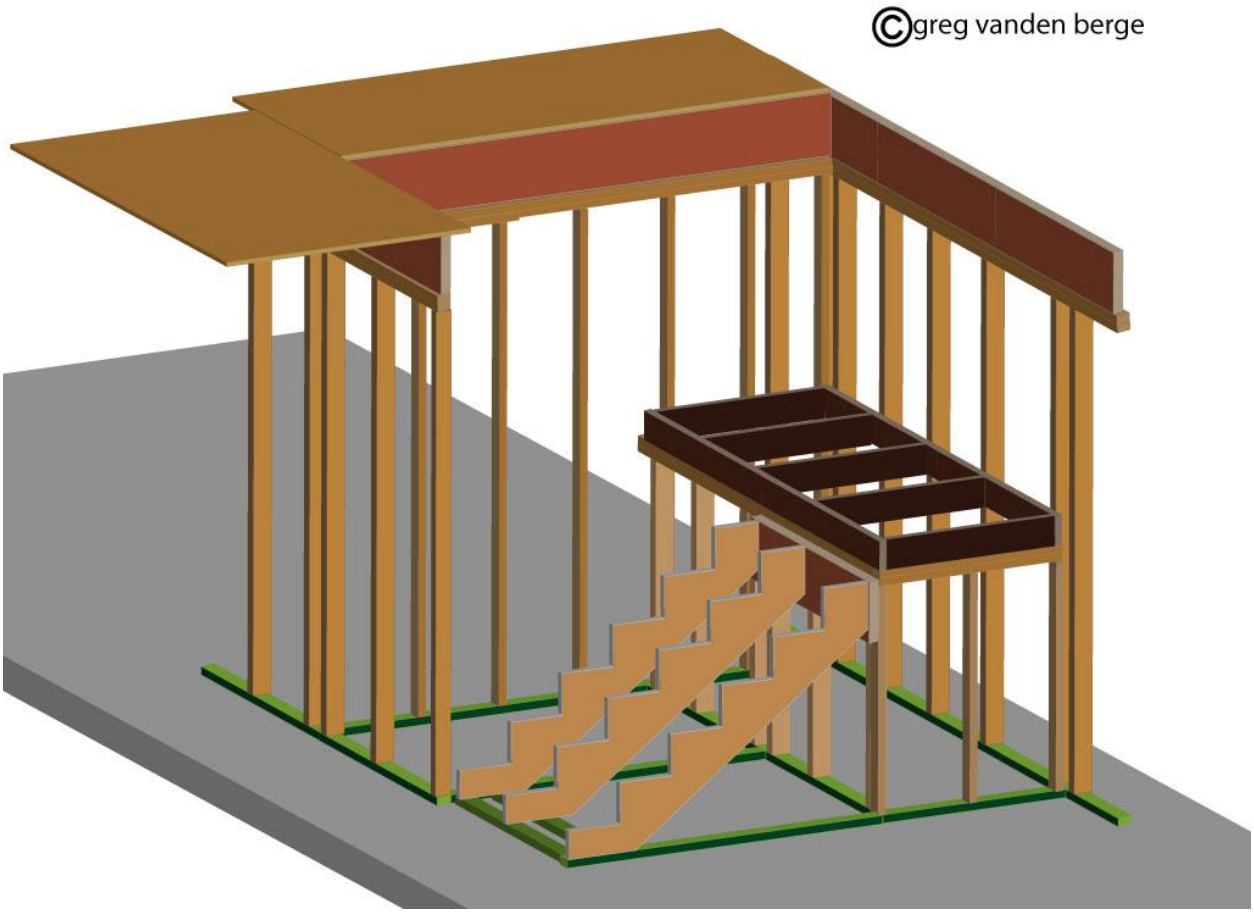
Step 19: In the next step you'll position the two side stair stringers accordingly. It wouldn't be a bad idea to use one nail to connect each stair stringer to the ledger, before nailing it off.

The reason for this is to make sure everything is where it needs to be. After you're happy with each stringers location and make sure the width of the stairway at the top is the same as the one on the bottom and the bottom plates under the stringers are supporting the bottom of the stringers structurally, then feel free to finish nailing off the stair stringers.

For 2 x 12 stair stringers I like to use at least 4 16-d nails to attach the top and bottom of the stair stringer, to the ledger and bottom plates.

http://www.pic.stairs4u.com/splitlevel/bottom_stair_stringer_foundation.htm

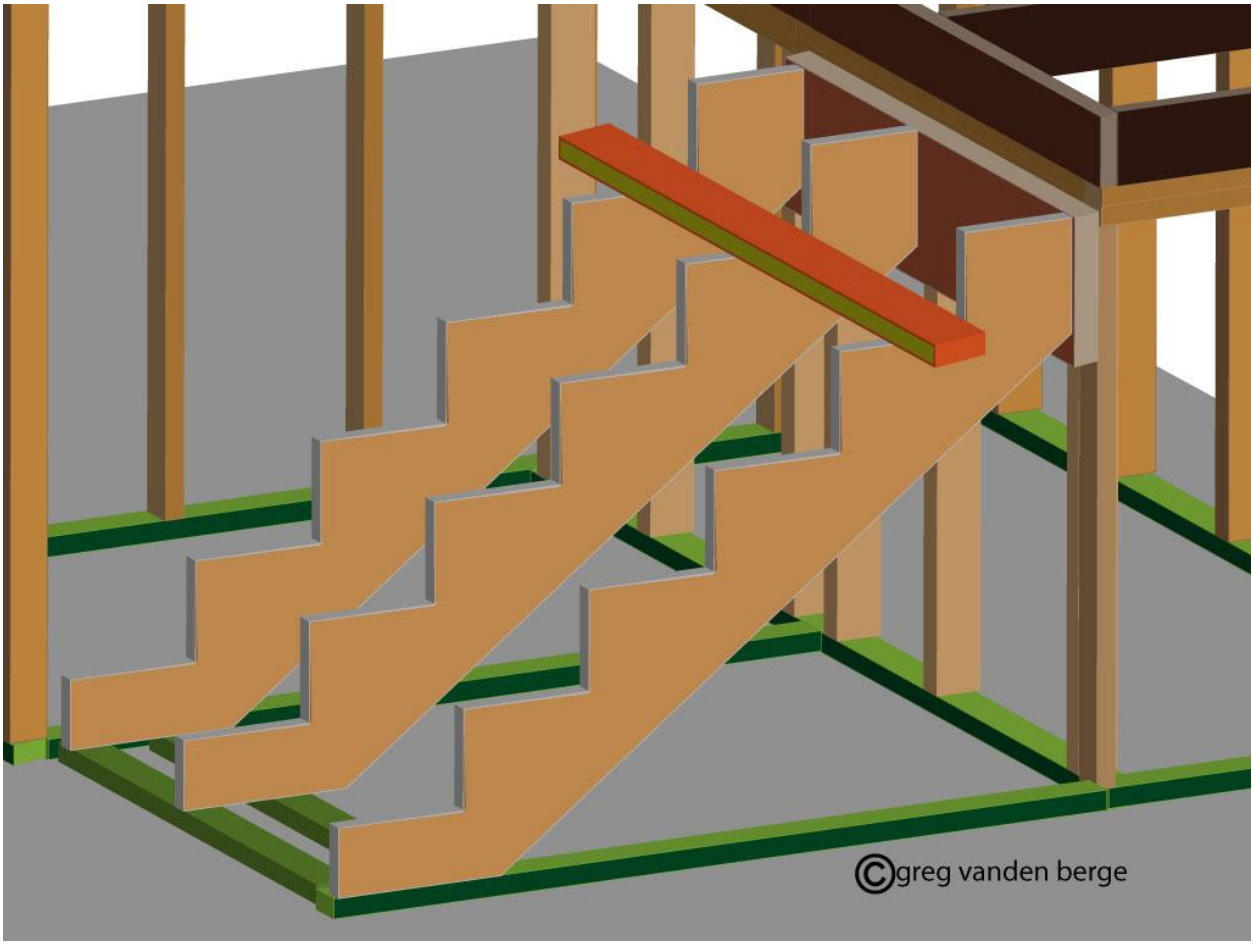
http://www.pic.stairs4u.com/splitlevel/stinger_nailed_to_landing_ledger.htm



Step 20: In the next step you will position the center stair stringer, exactly in the middle of the two outer stringers. However, you will not be nailing it off completely, until you have made any necessary adjustments.

Simply attach the center stair stringer with one nail through the stringer and into the ledger, just in case it needs to be repositioned.

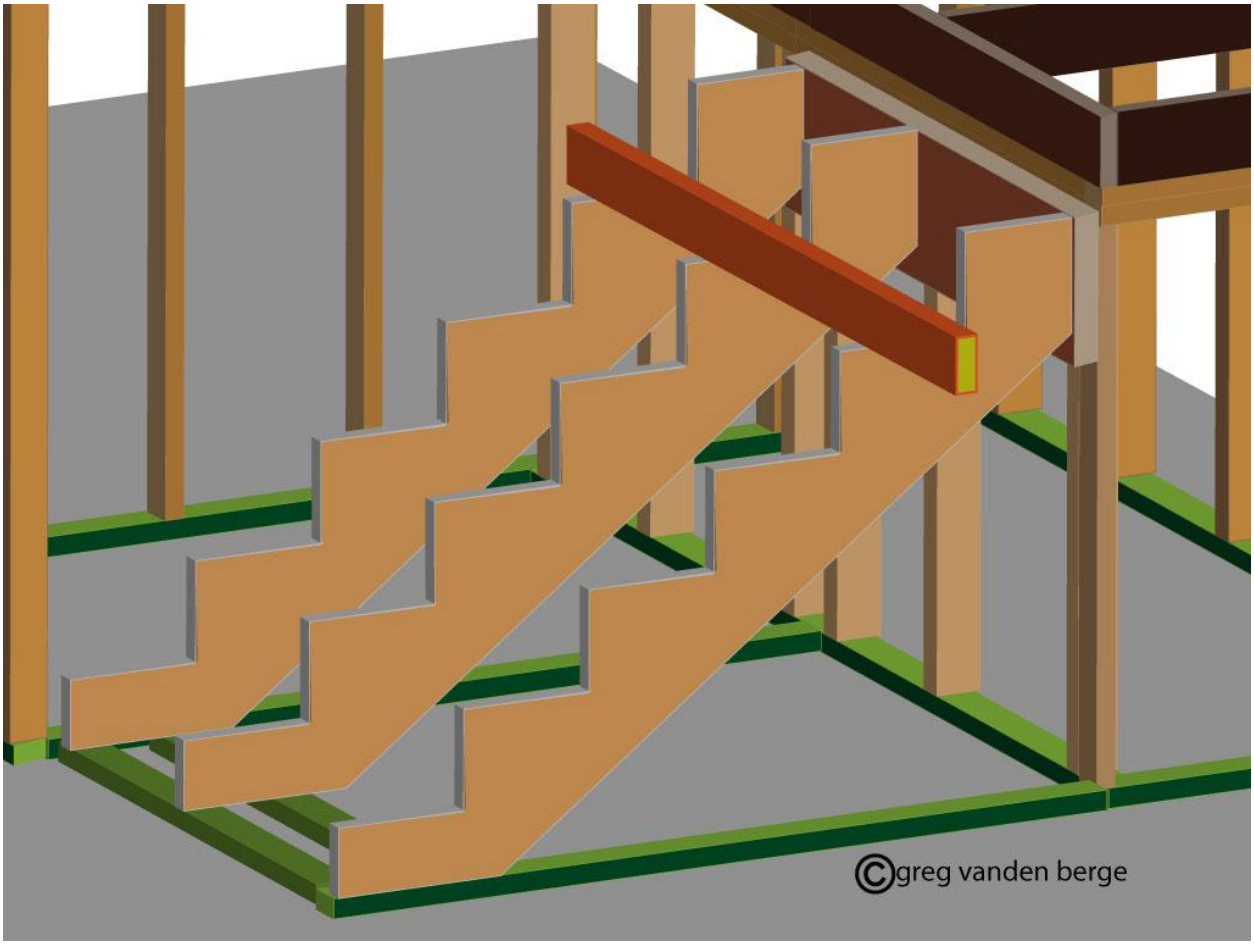
http://www.pic.stairs4u.com/splitlevel/nailed_and_adjusted_stringers.htm



Step 21: Grab a straight edge or level and set it on top of tread number five. Then push it tight against the risers, to make sure all three of them line up correctly.

If the center stringer needs to move forward towards the level or straight edge then you can simply wedge shims in between the ledger and the stringer until it lines up with the other two stringers.

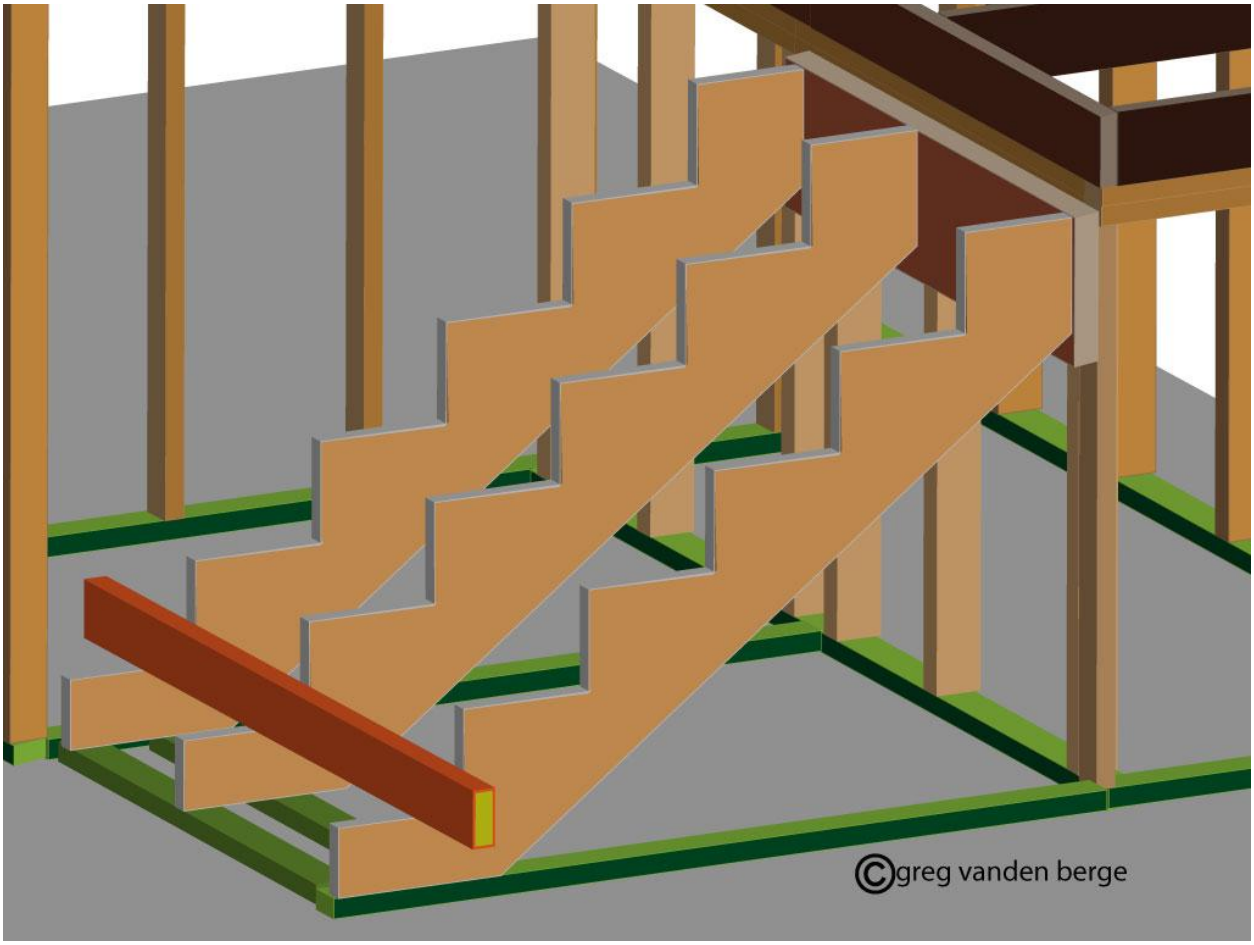
However, if the stringer needs to go back towards the ledger then the stringer will need to be removed so you can cut a little off of the stringer side where it connects to the ledger, to make the necessary adjustments.



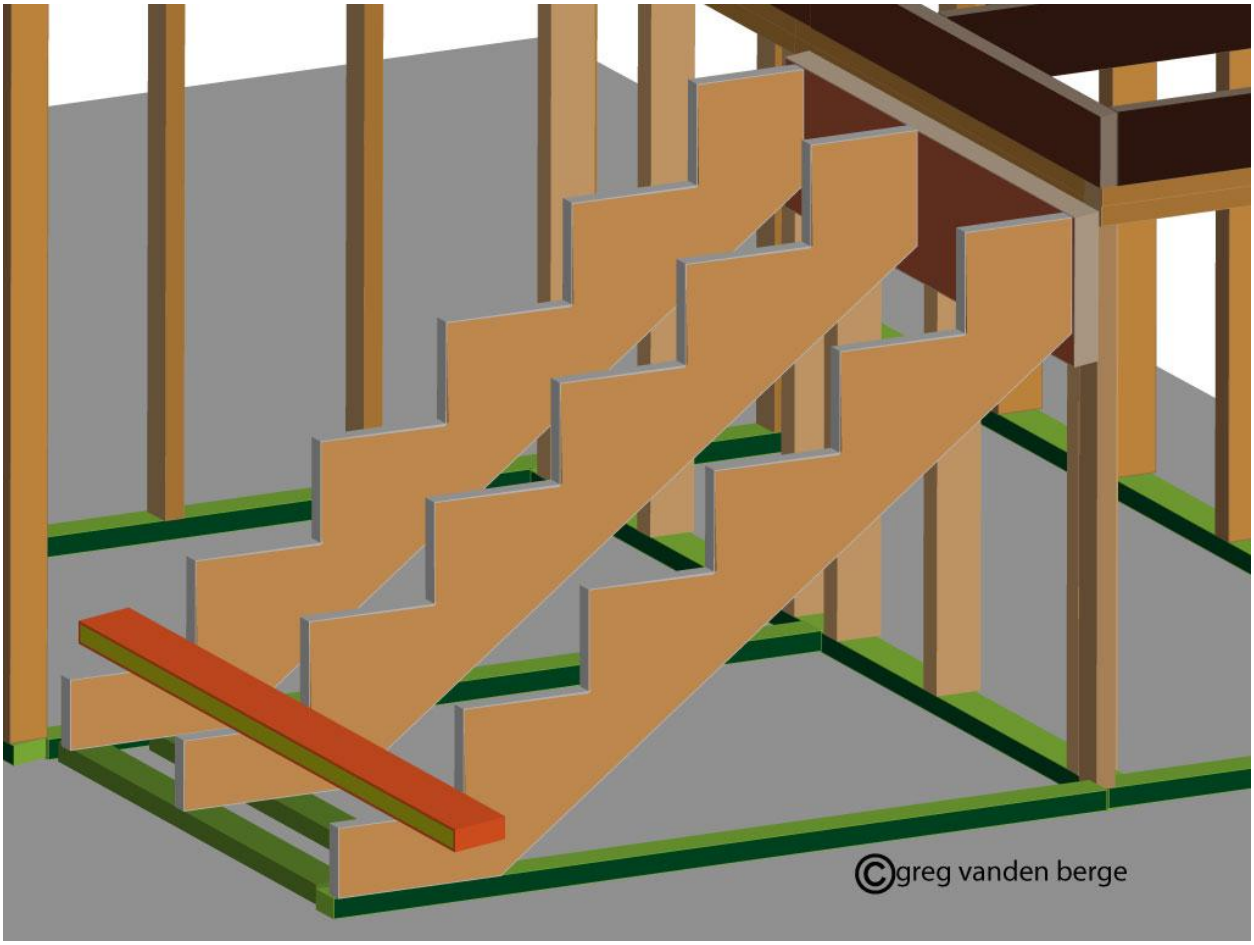
Step 22: Now that you've checked the risers, it's time to check the treads. Simply turn the straight edge or level up as shown in picture above, to verify whether or not all three of the stringers line up perfectly.

Simply raise or lower the middle stringer to make the necessary adjustments.

http://www.pic.stairs4u.com/splitlevel/checking_and_adjusting_stringers.htm



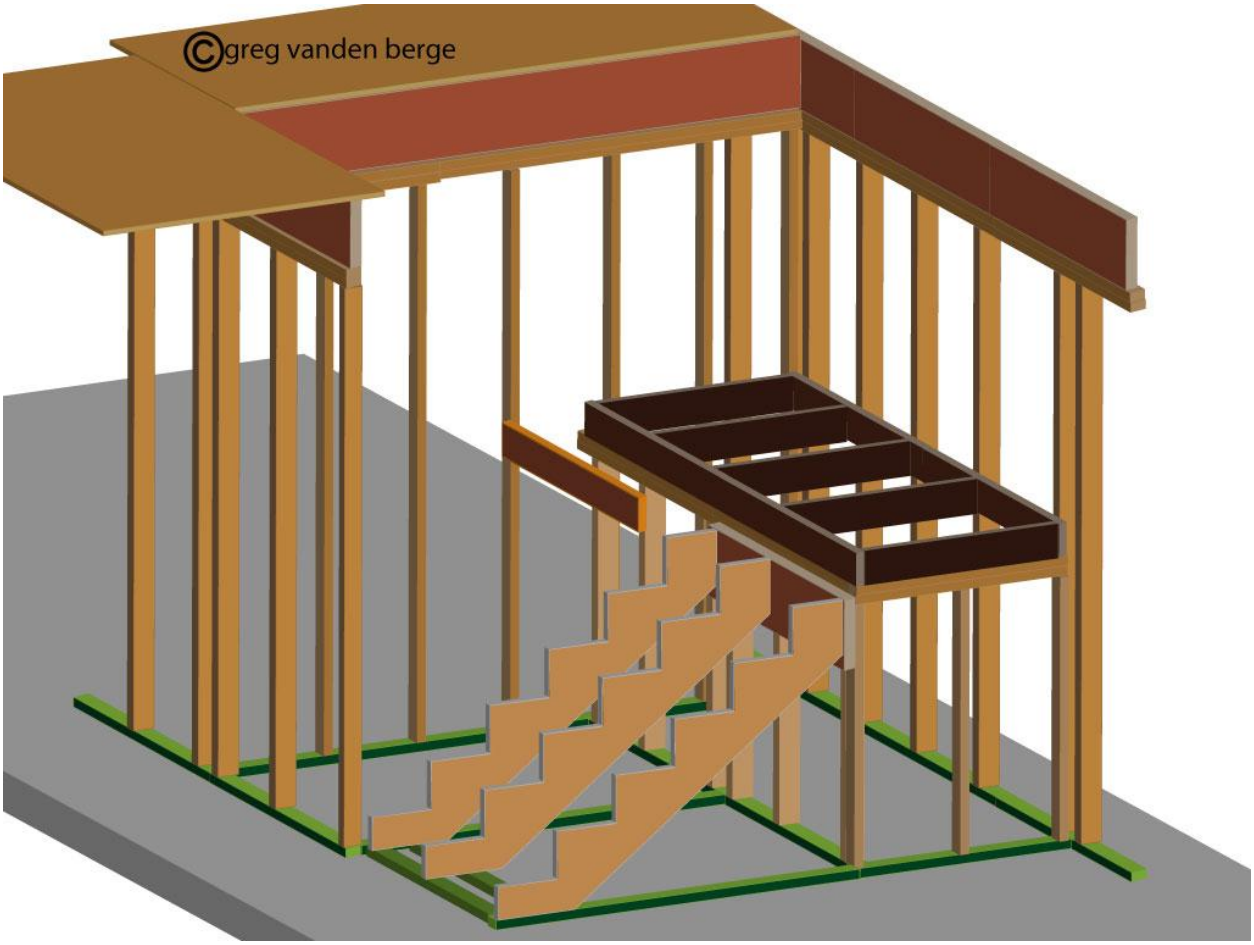
Step 23: Now that you've checked the top, it will be time to check the bottom. Simply repeat the steps you've already taken to make the necessary adjustments on the top, for the bottom.



Step 24: Now, what do you do when the top lines up perfectly with the straight edge and then go down to the bottom, only to find out it needs to move in one direction or the other. Again, this is why we don't nail everything off until we've checked everything and double checked it again.

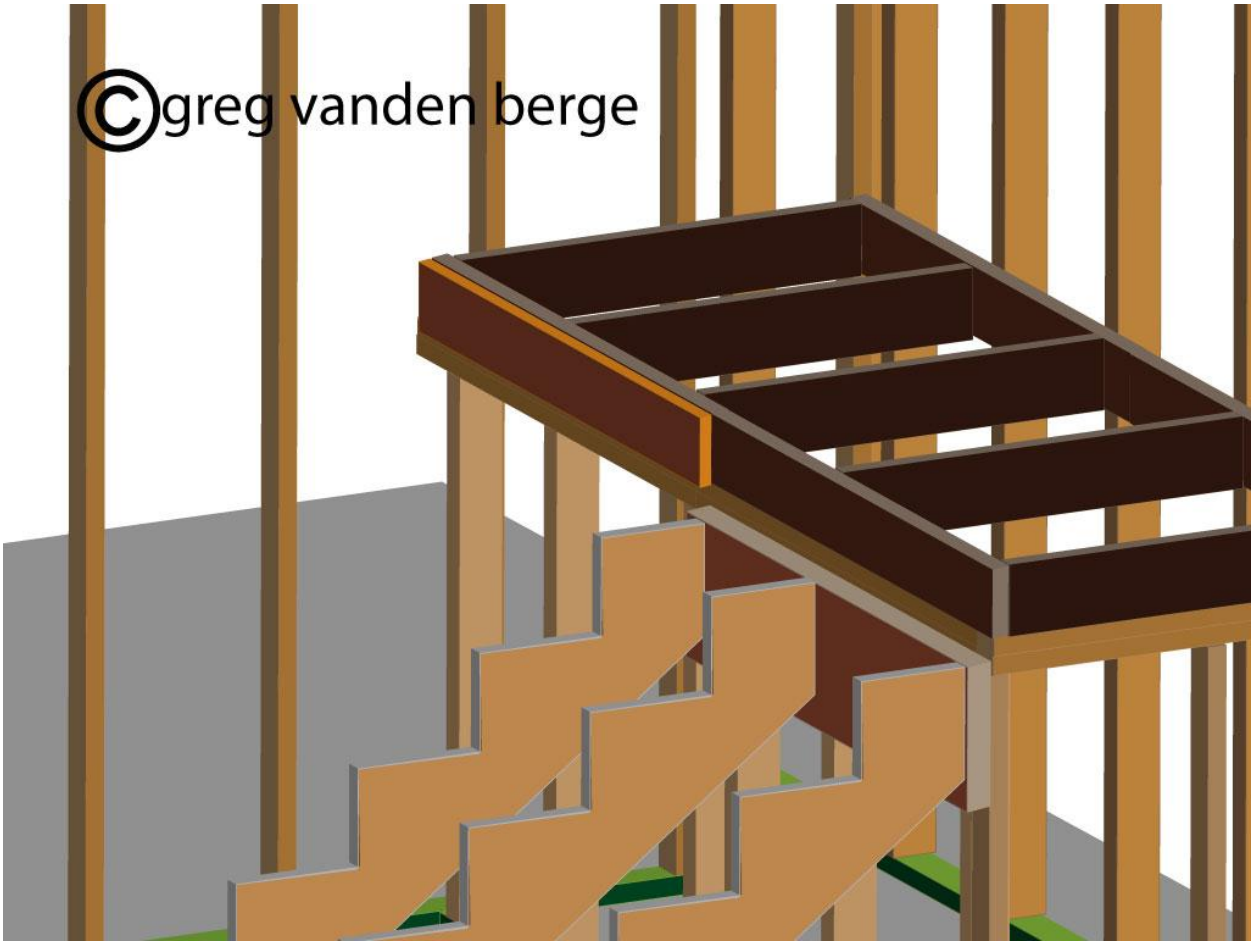
It wouldn't be a bad idea to grab your straight edge and check the top and bottom, before making any adjustments. If the stringers weren't cut perfectly then that they might need to be re-cut or shims added to make the necessary adjustments.

However, if the center stair stringer can be adjusted to produce a happy medium, without producing a safety hazard or extremely large gaps (over 3/8 of an inch) then I will leave it up to you, whether you proceed or cut new stringers or even get a little creative, to solve this problem.



Step 25: The next step will be to cut a 2 x 6 or 2 x 8 bottom stringer ledger the same width as the upper stairs and then nail it to the landing framing.

The top of the bottom stringer ledger will line up with the top of the landing joist.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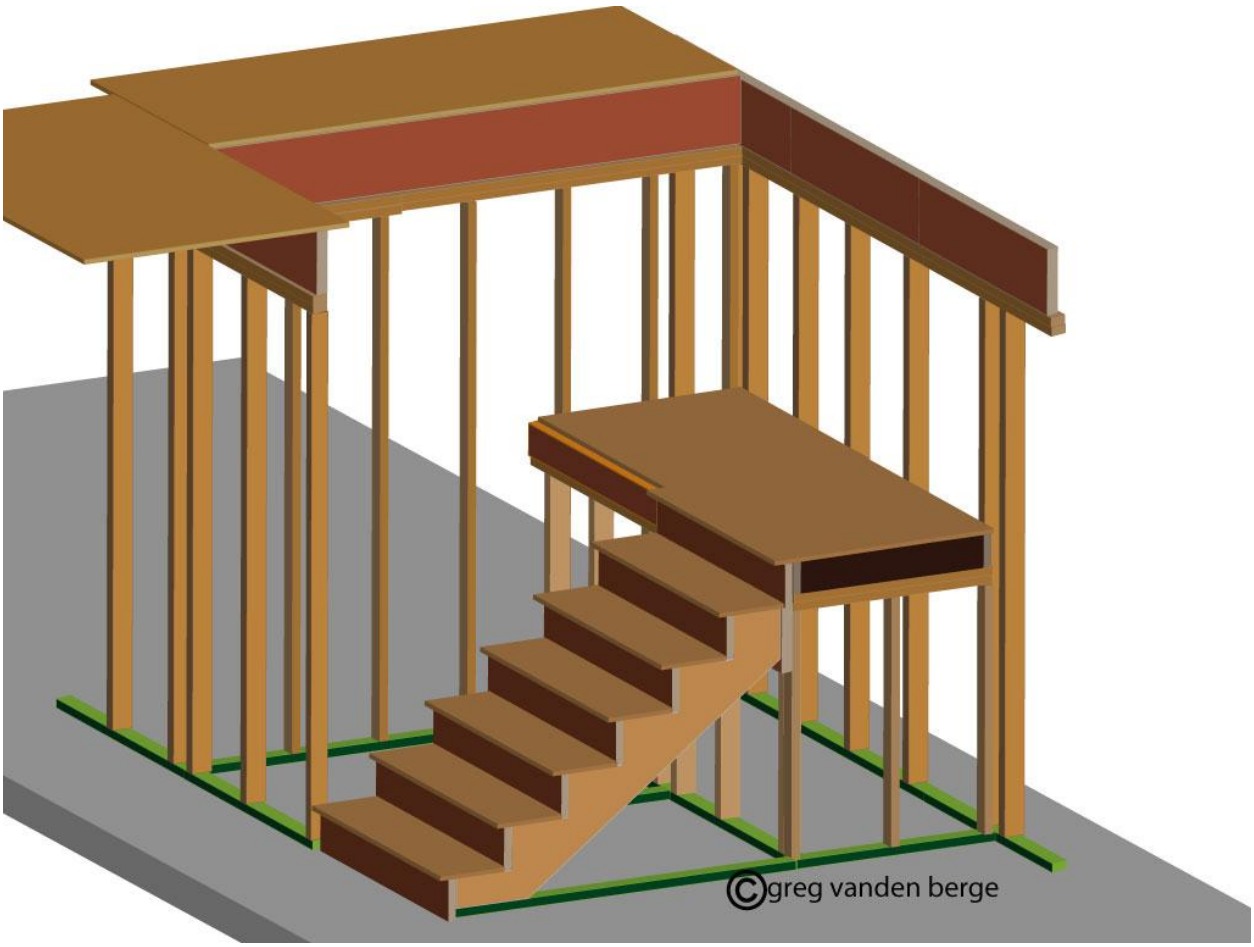
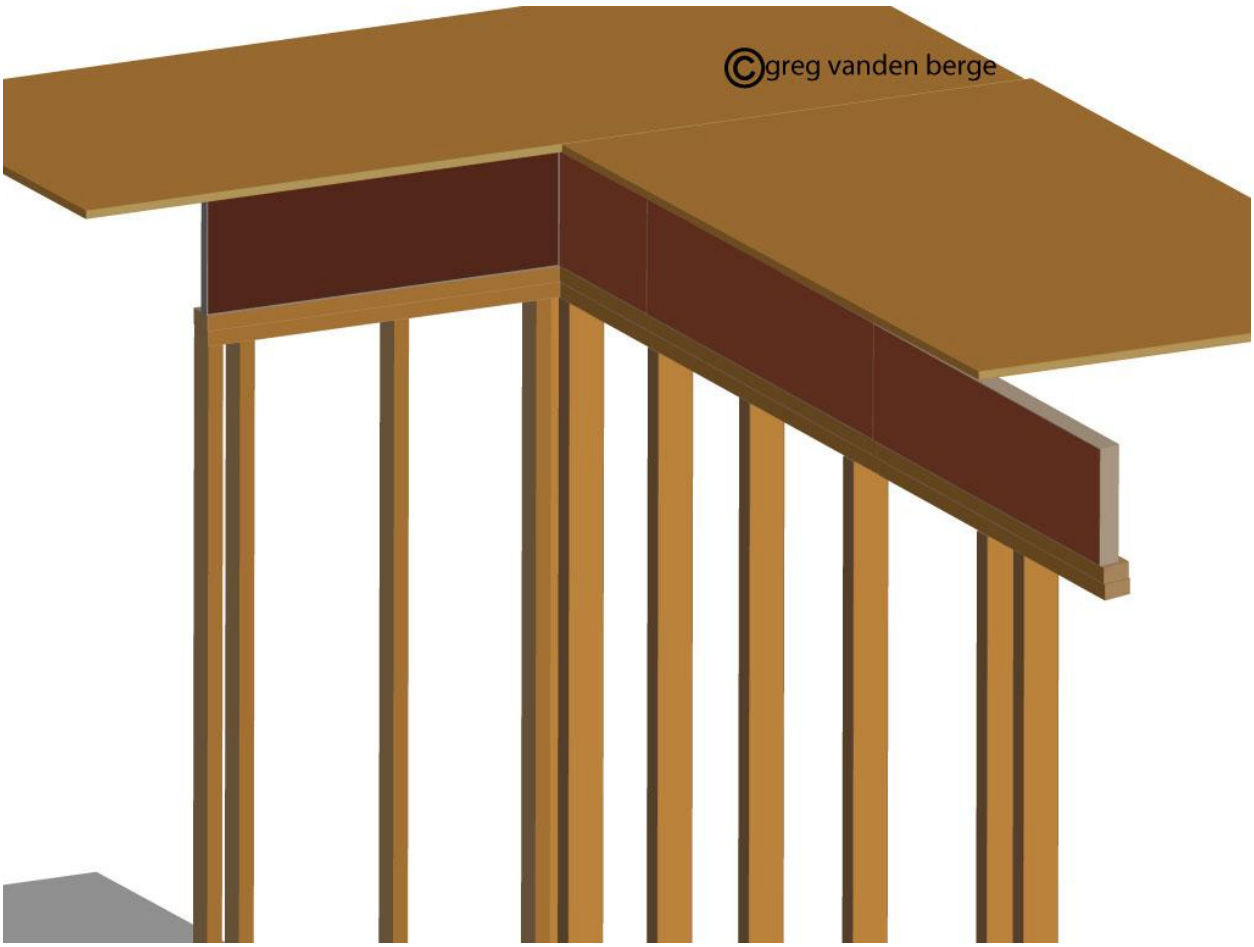


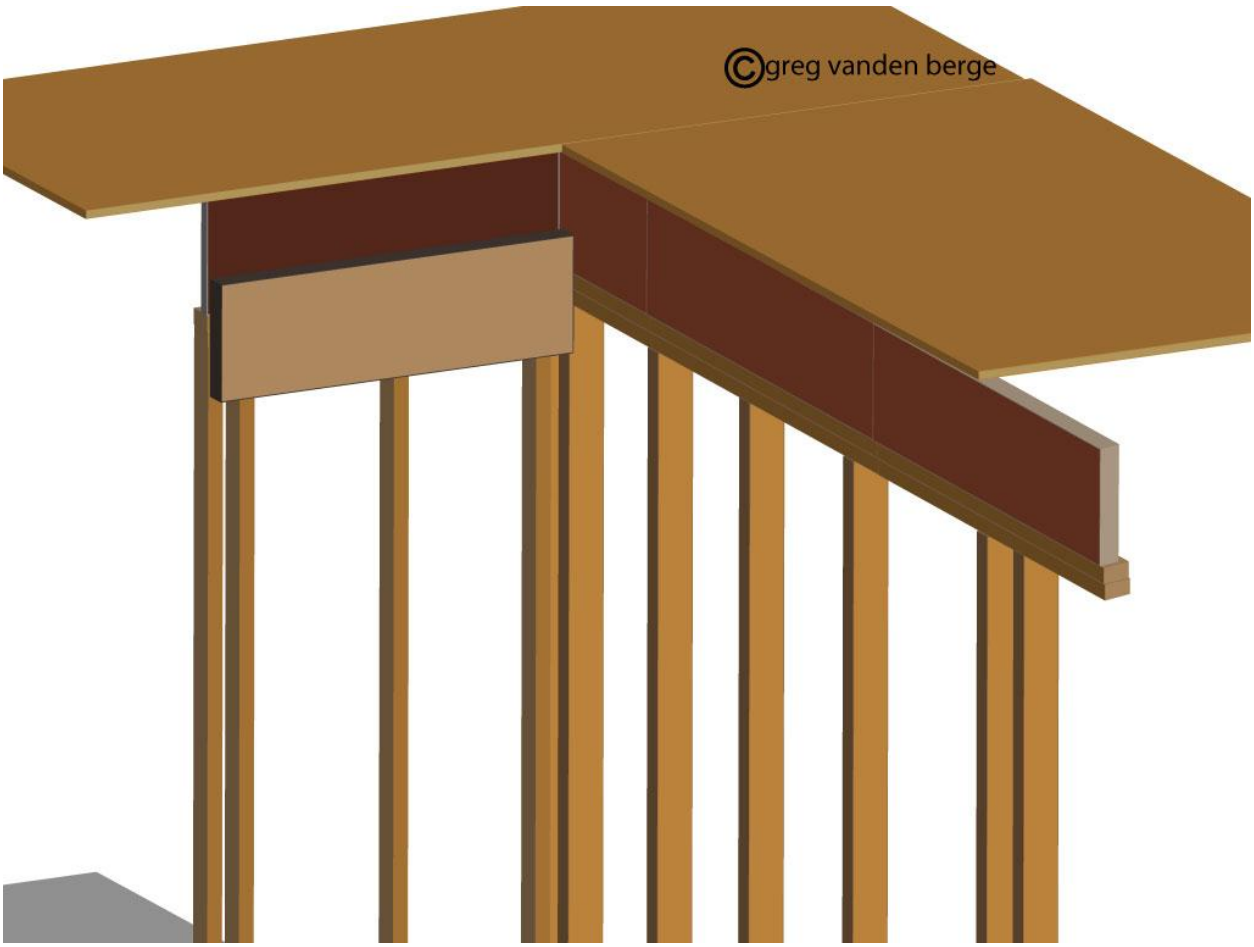
You can cut your treads and risers and even the landing sheathing or wait until the upper stringers have been installed. Sometimes it's easier to work on the stairs when you can walk up and down the lower stairway.

The choice will be left up to you. If not then proceed to step 26.

Skip ahead to step 30 for riser and tread installation steps.



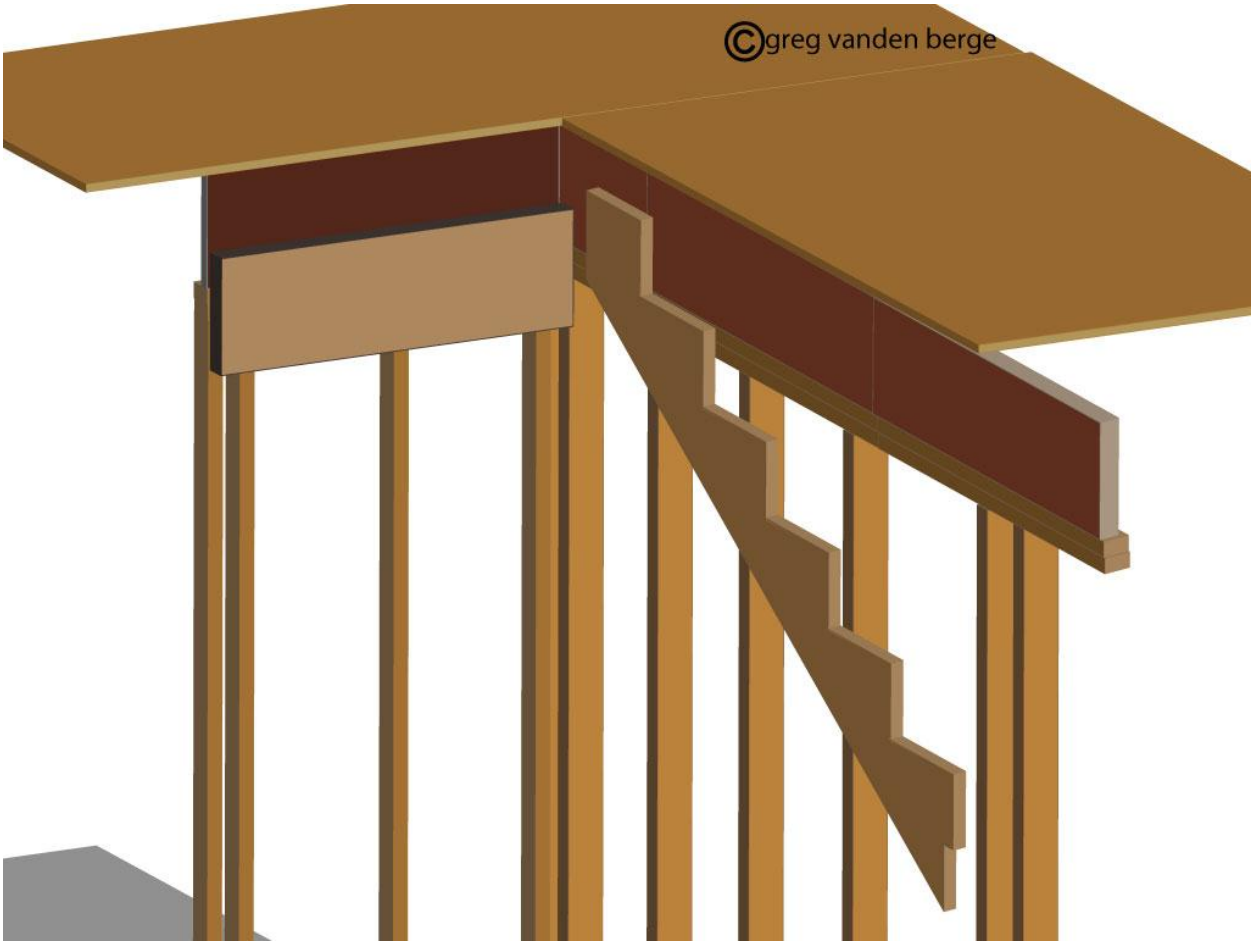
Step 26: In the next step we will attach the top stringer ledger to the upper floor framing and wall.



As long as the stair tread and floor sheathing materials are the same thickness, you can use the overall stair riser height measurement, but if these materials are different then you will need to either lower or raise the ledger to adjust for the difference.

For example: We have a 7 1/2 inch stair riser height measurement and we will be using 3/4" plywood for our stair treads and upper floor sheathing. Simply measure from the top of the floor joist down 7 1/2 inches and mark each side of the floor joist, where the ledger will attach.

Then cut a 2 x 10 or 2 x 12 stair ledger the width of the stairway. The next step would be to line the top of the stair ledger up with the marks you made, representing the stair riser height and attach the upper stair ledger.

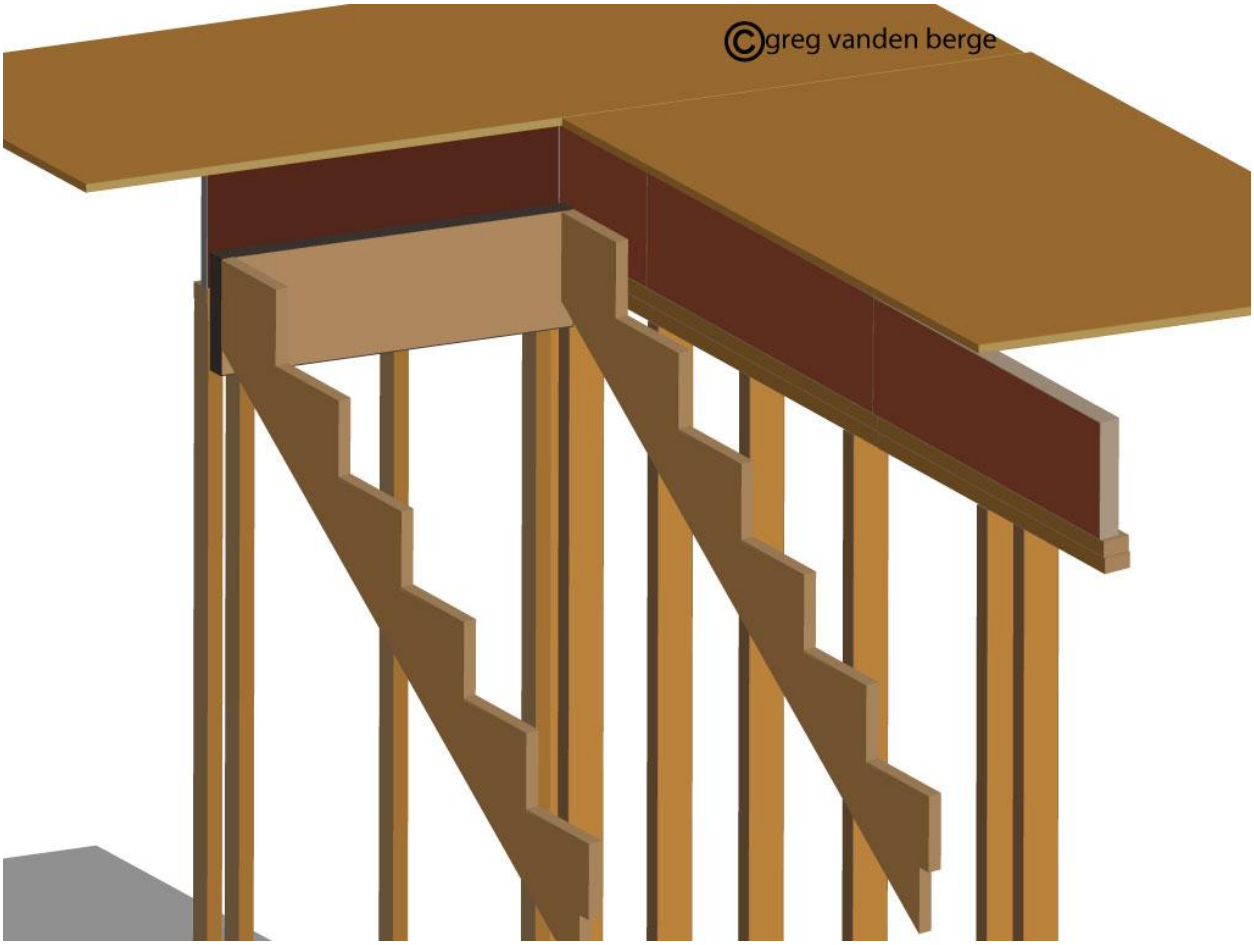


Step 27: Next we will position the upper stair stringer, while placing the bottom notch on top of the bottom stringer ledger, while letting the top rest on the upper stair ledger.

I probably made this sound easier than it actually is, but you never know, you could get it right the very first time. However, what if the stair stringer needs to be cut or shimmed in order to fit properly.

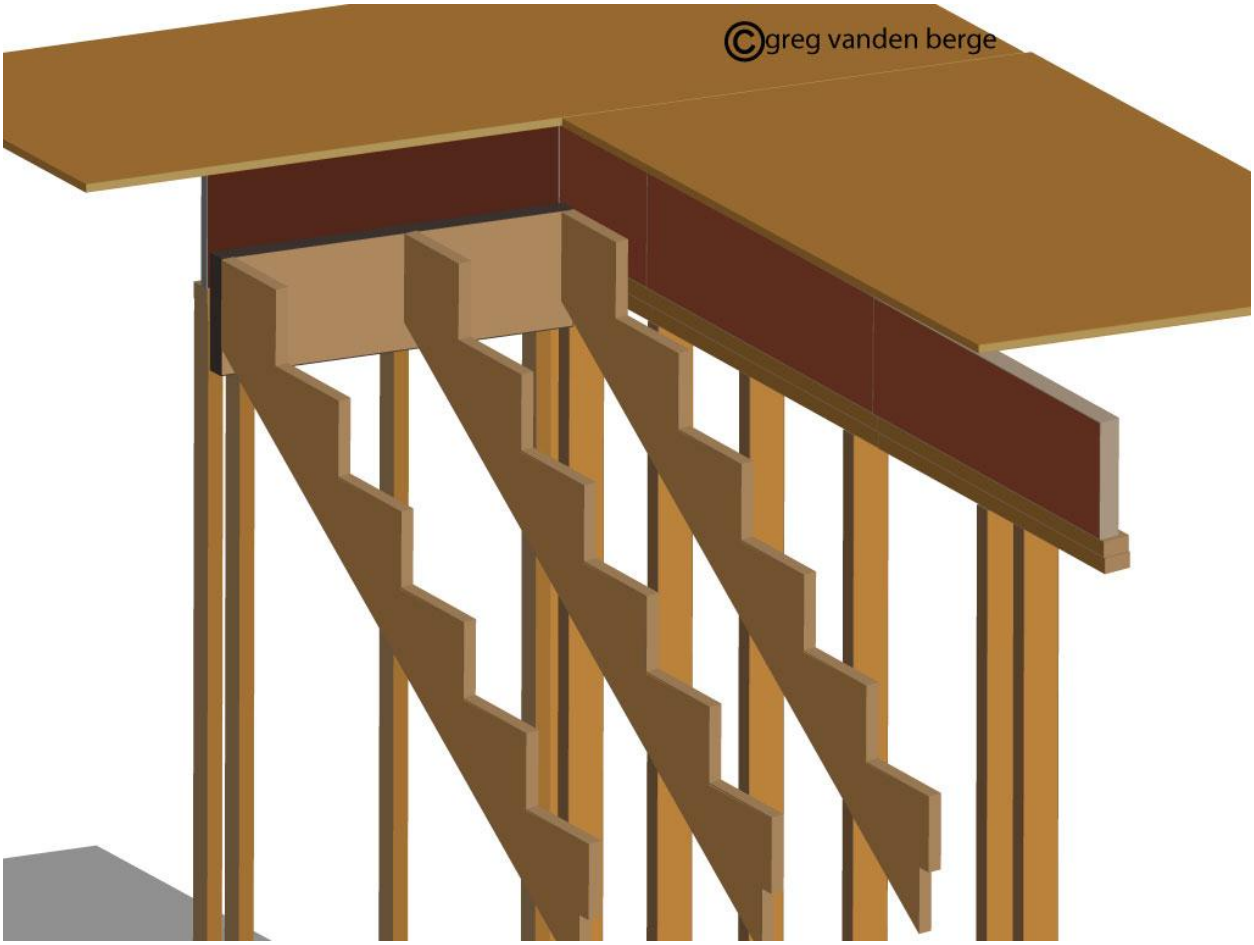
If this is the case, then hopefully all of your adjustments will be minor (less than a half-inch). If you need to move the stair stringer towards the landing, simply remove a little off of the notched side, of the bottom stringer and if the stringer is going away from the landing then simply add a piece of wood to the bottom stringer ledger to make up the difference.

Whatever you do, make all of the adjustments at the bottom, unless you're prepared to move the upper floor joist.



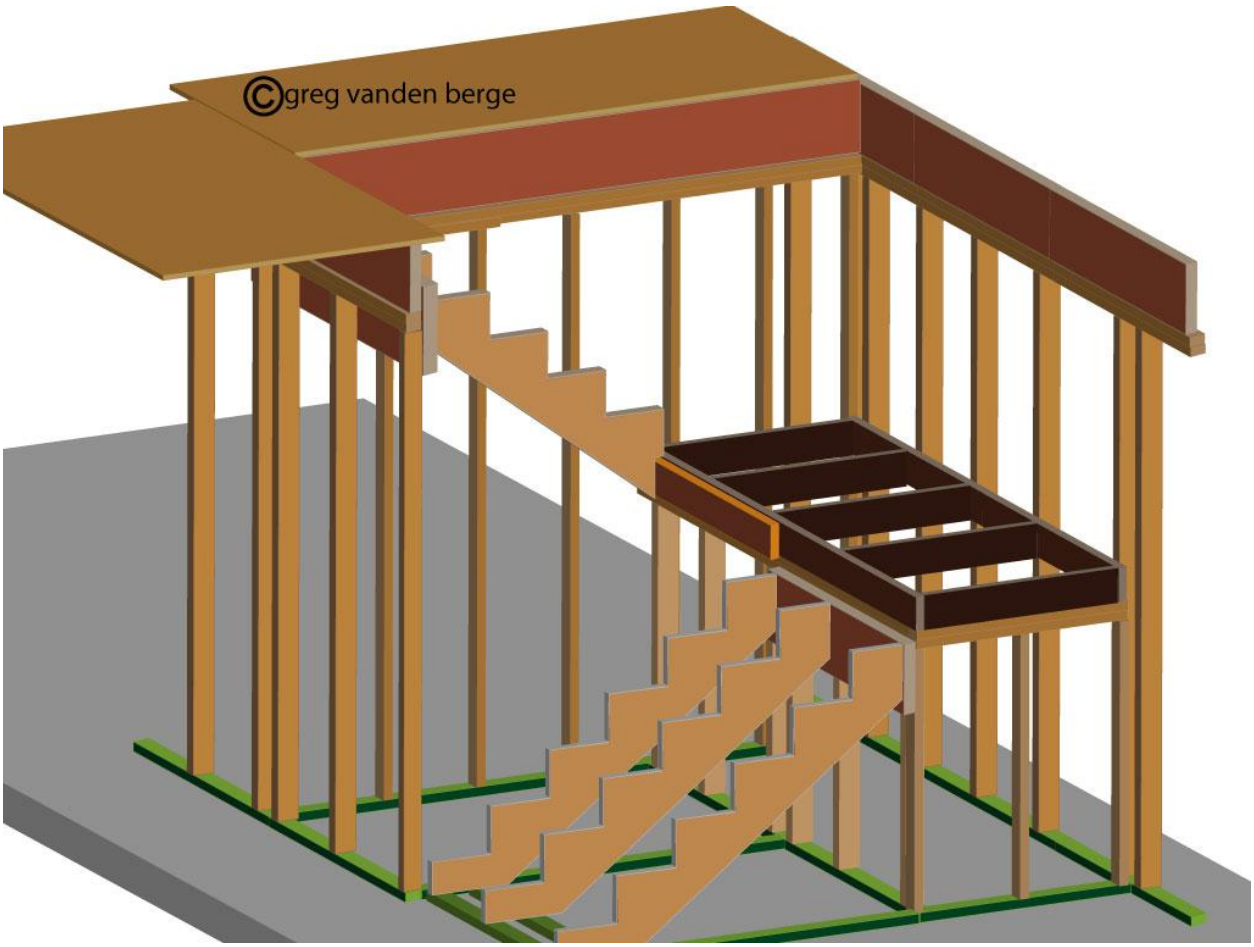
Step 28: The next step will be to position the other stringer and make any adjustments necessary, before nailing it off completely. Make sure the bottom overall width of the stairway measurement is the same distance as the upper one.

In other words these stair stringer should be parallel to each other.



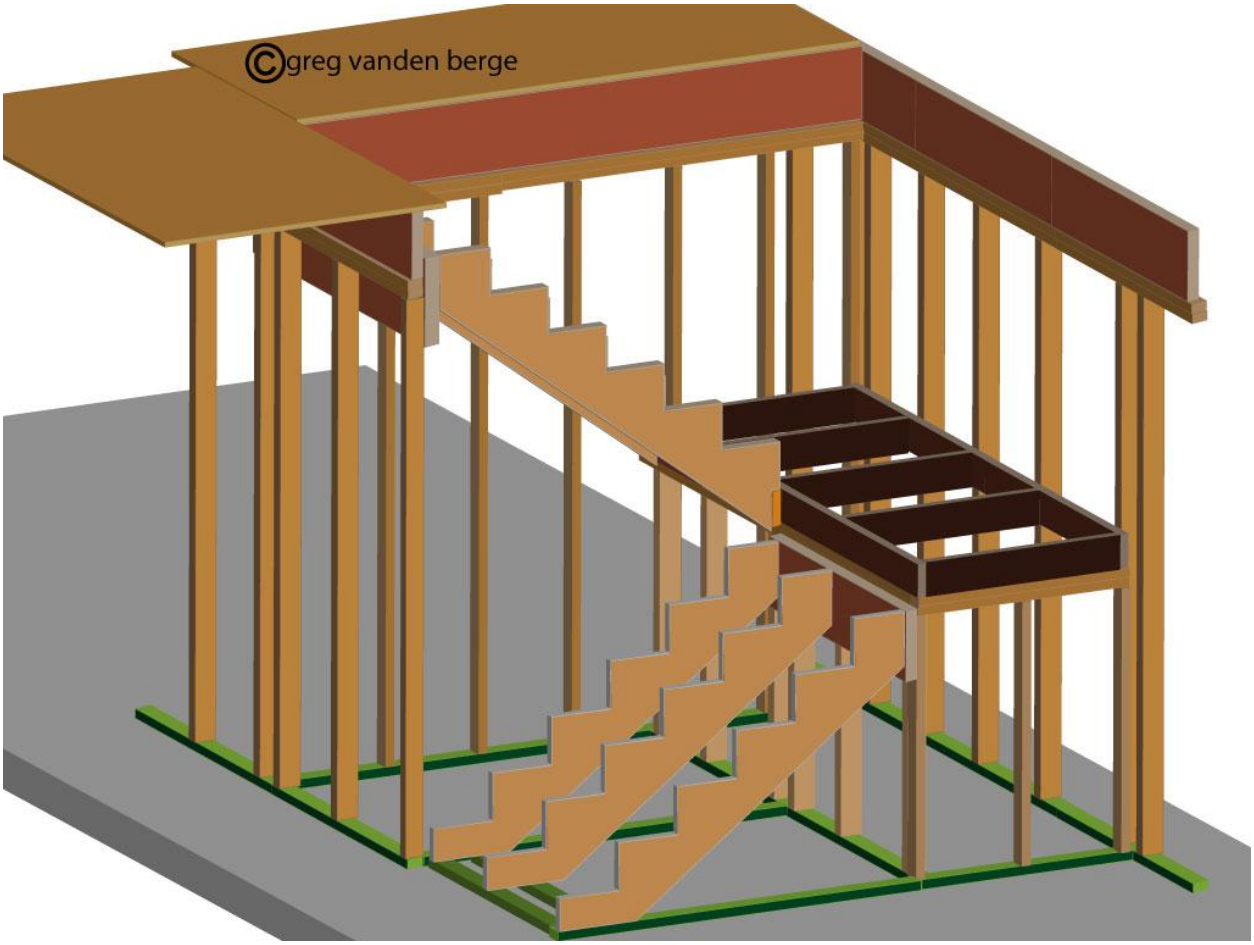
Step 29: In the next you will position the center stair stringer directly in between the two outer stringers. Remember, do not nail the center stair stringer off until it has been adjusted and lines up perfectly or as close to it with the other two stringers.

Refer back to steps 21 and 22 if necessary.

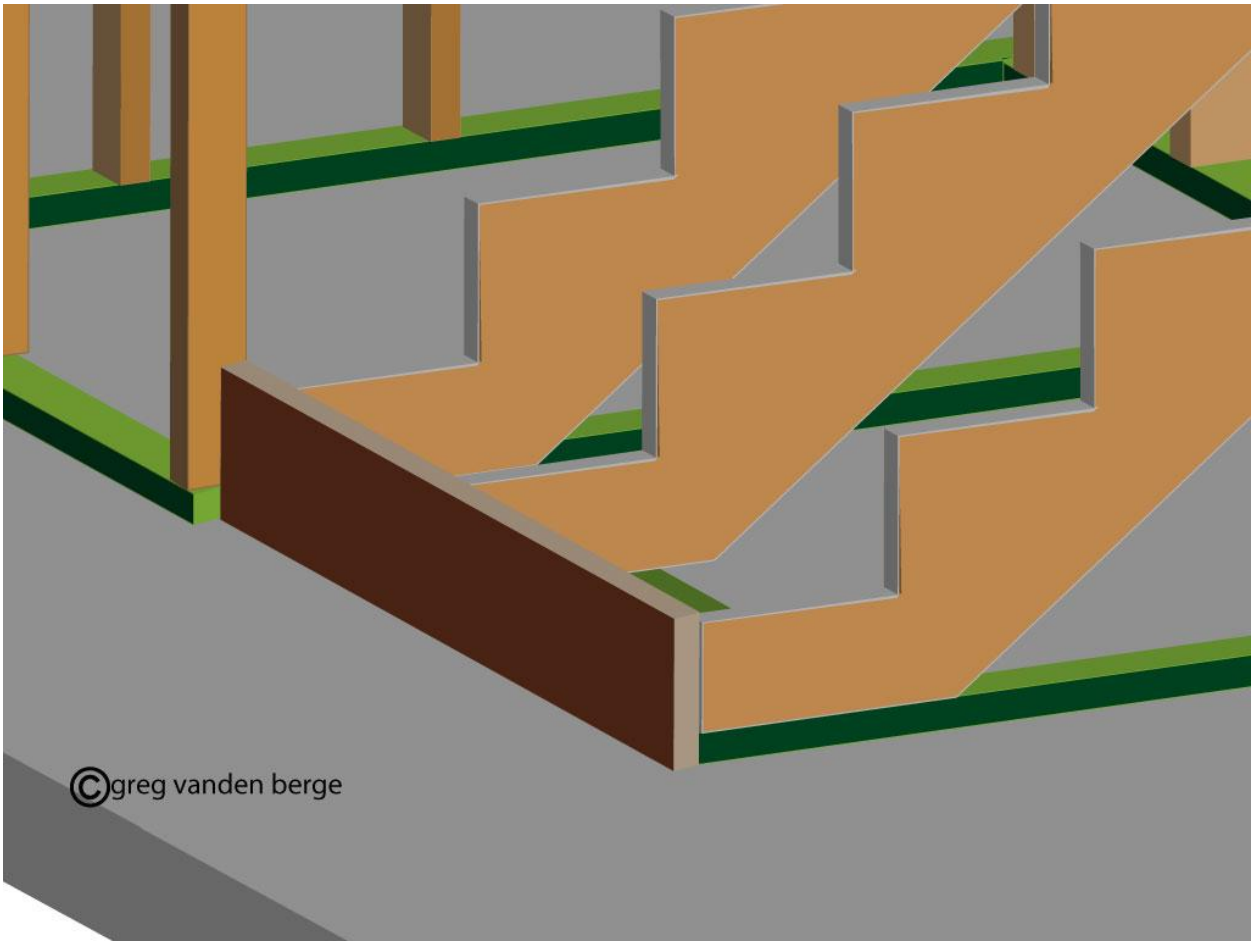


The illustration above provide you with a clear picture of how the bottom notch of the stair stringer sits on top of the bottom stair stringer ledger.

The illustration above and below simply provides you with a different angle, for more clarification, if needed.



This illustration provides you with a nice view of the outer stringer and how it attaches to the bottom stringer ledger and the upper stringer ledger.



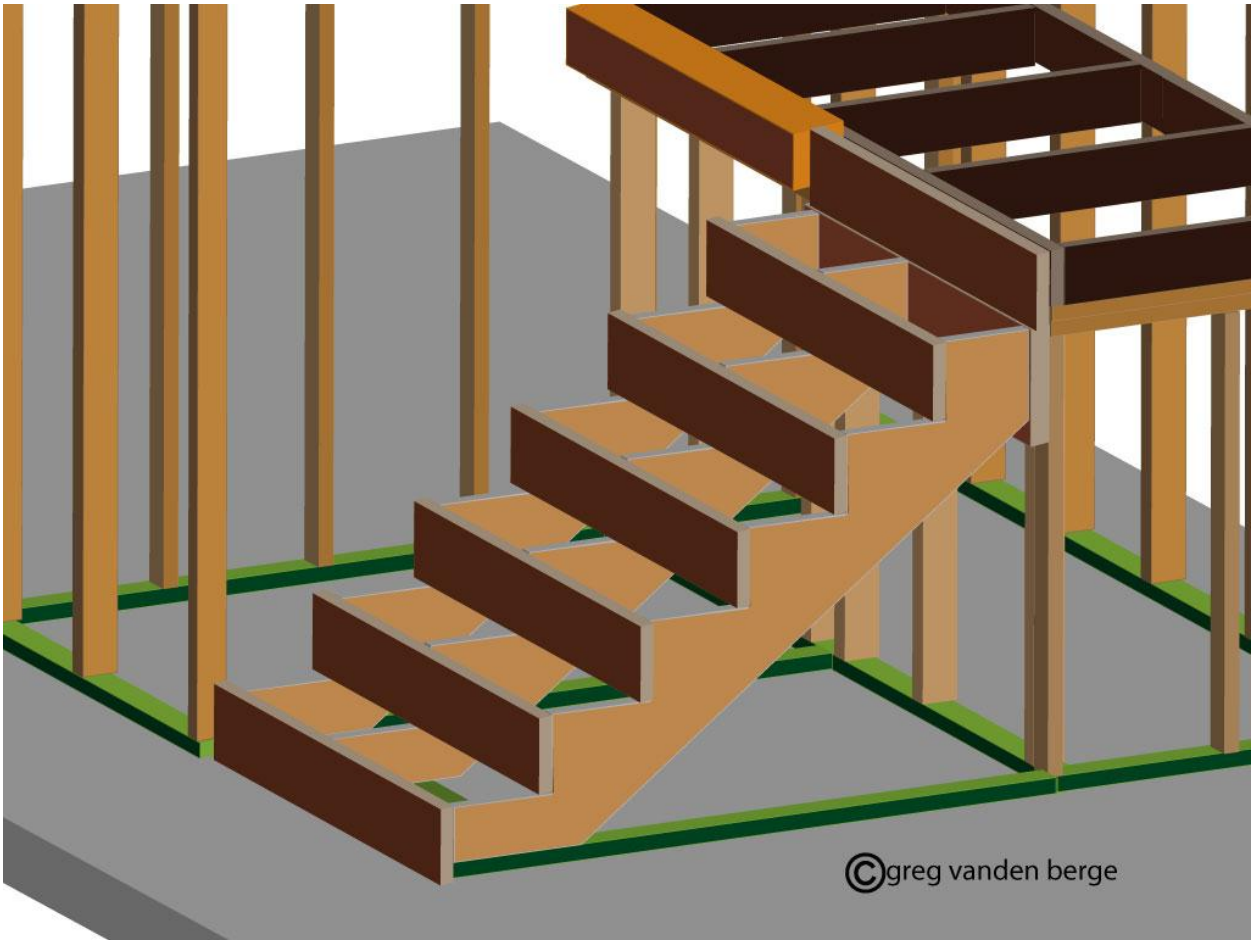
Step 30: By now you should have the frame of the stairway completed and now it's time to cover it up with a few risers, treads and landing sheathing. We're going to start by installing the first or lower riser and working our way up.

At this point, feel free to cut all of the risers and treads for the entire stairway or lower section, whatever you feel comfortable doing. If you need to cut each riser and tread individually and install them one at a time then you can do that also.

Every stair tread and riser should be the exact same size except for the bottom riser or any other risers that would need to be adjusted for any tread or landing material thickness variations.

The lower or first riser will have the thickness of the first stair tread deducted from it.

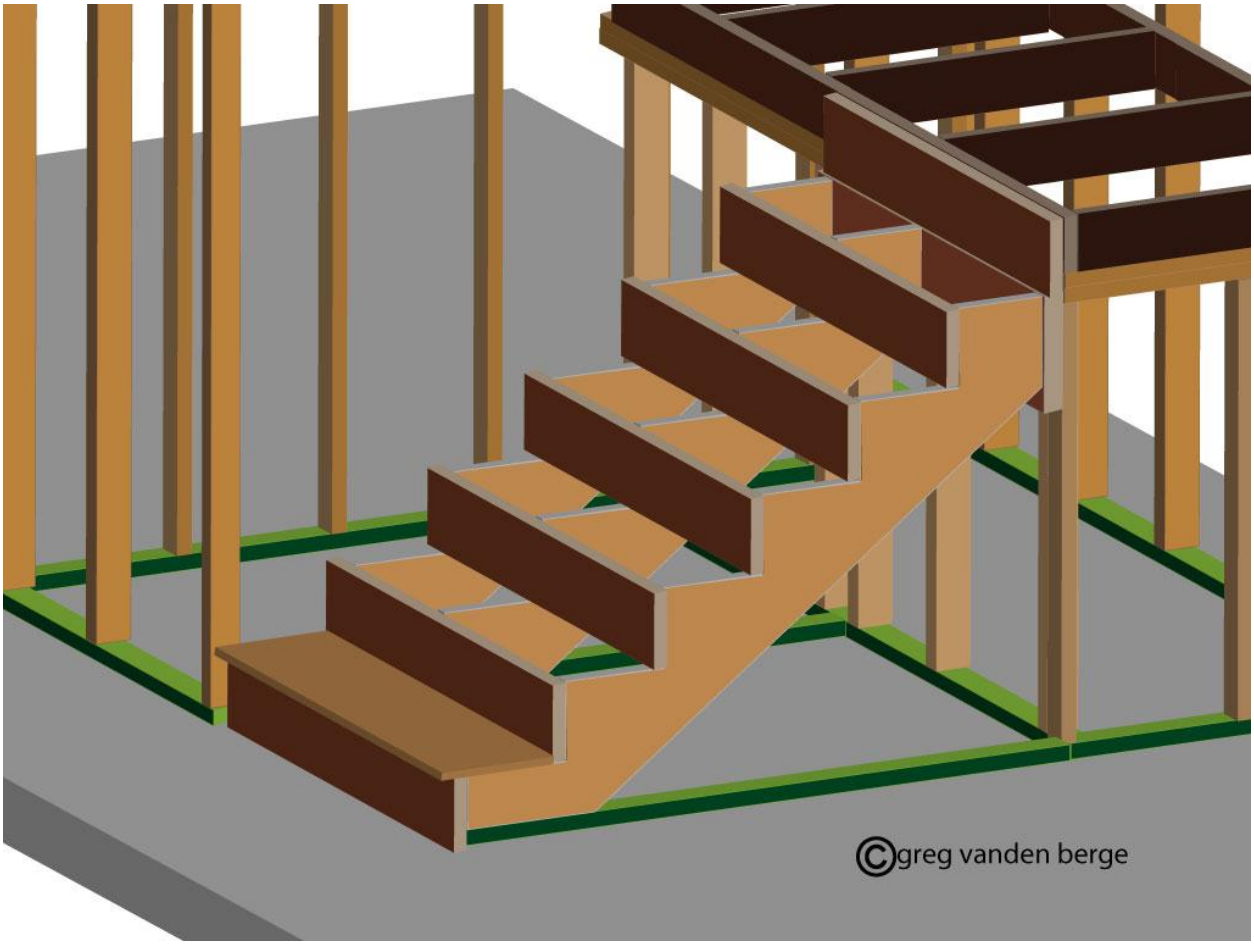
For example: If we have 7 1/2 inch risers and 3/4" thick stair treads then we will need to deduct three quarters of an inch from 71/2 inches, leaving us with a 6 3/4" bottom riser height.



Step 31: In the next step you can attach the rest of the lower stairway risers to the stringers or stair framing. I like to start at the bottom and work my way up.

Whatever you do, try to avoid standing on the stair stringers while you're nailing the risers. I've seen the tips of the stair stringers break off and under the wrong circumstances something like this could be hazardous to your health.

http://www.pic.stairs4u.com/splitlevel/nailed_risers_on_lower_stairway.htm

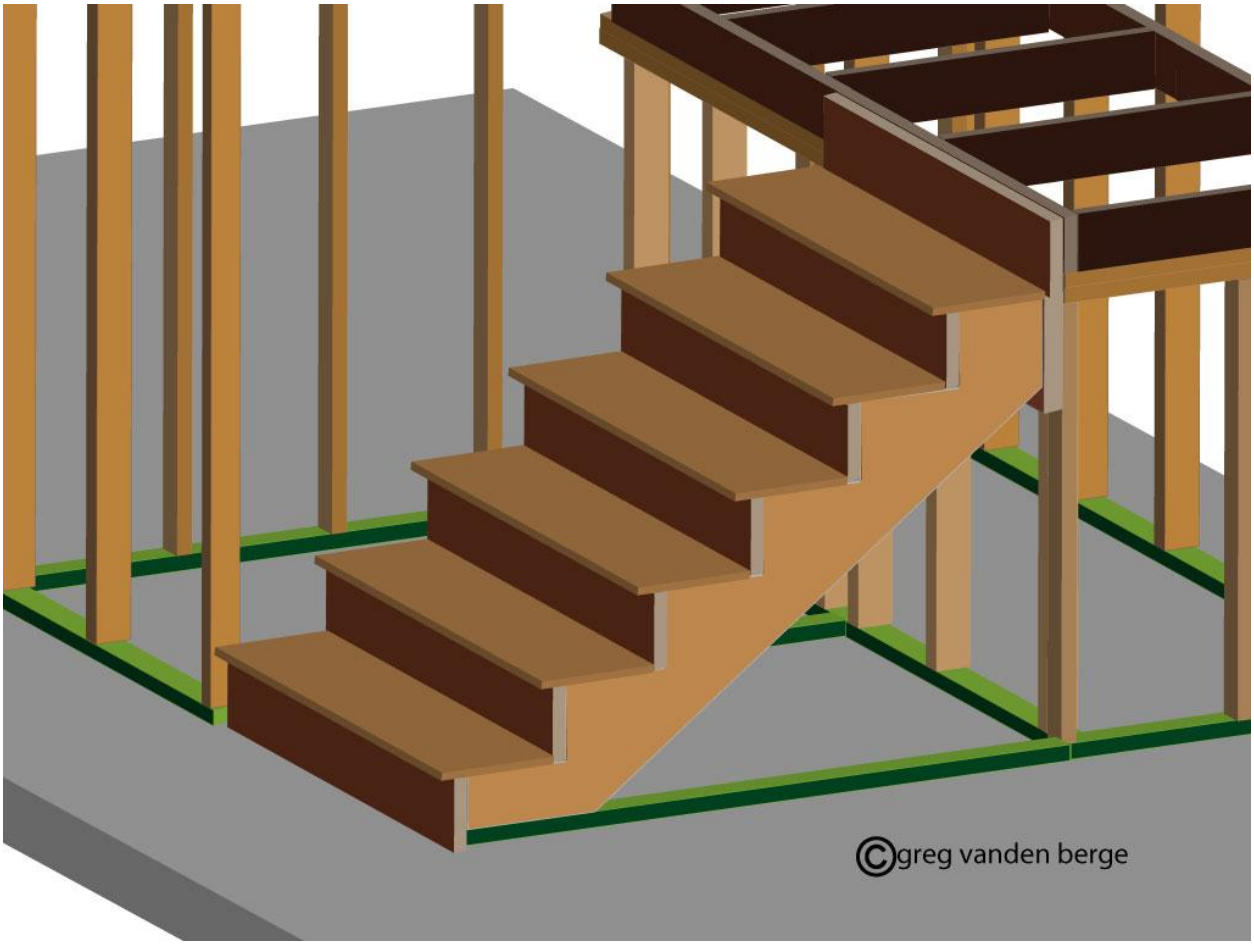


Step 32: In the next step you can nail the treads on, starting from the bottom and working your way up to the top.

http://www.pic.stairs4u.com/splitlevel/finished_bottom_stairway.htm

For additional holding power, you can use glue or other constructions adhesives.

http://www.pic.stairs4u.com/splitlevel/construction_adhesive.htm

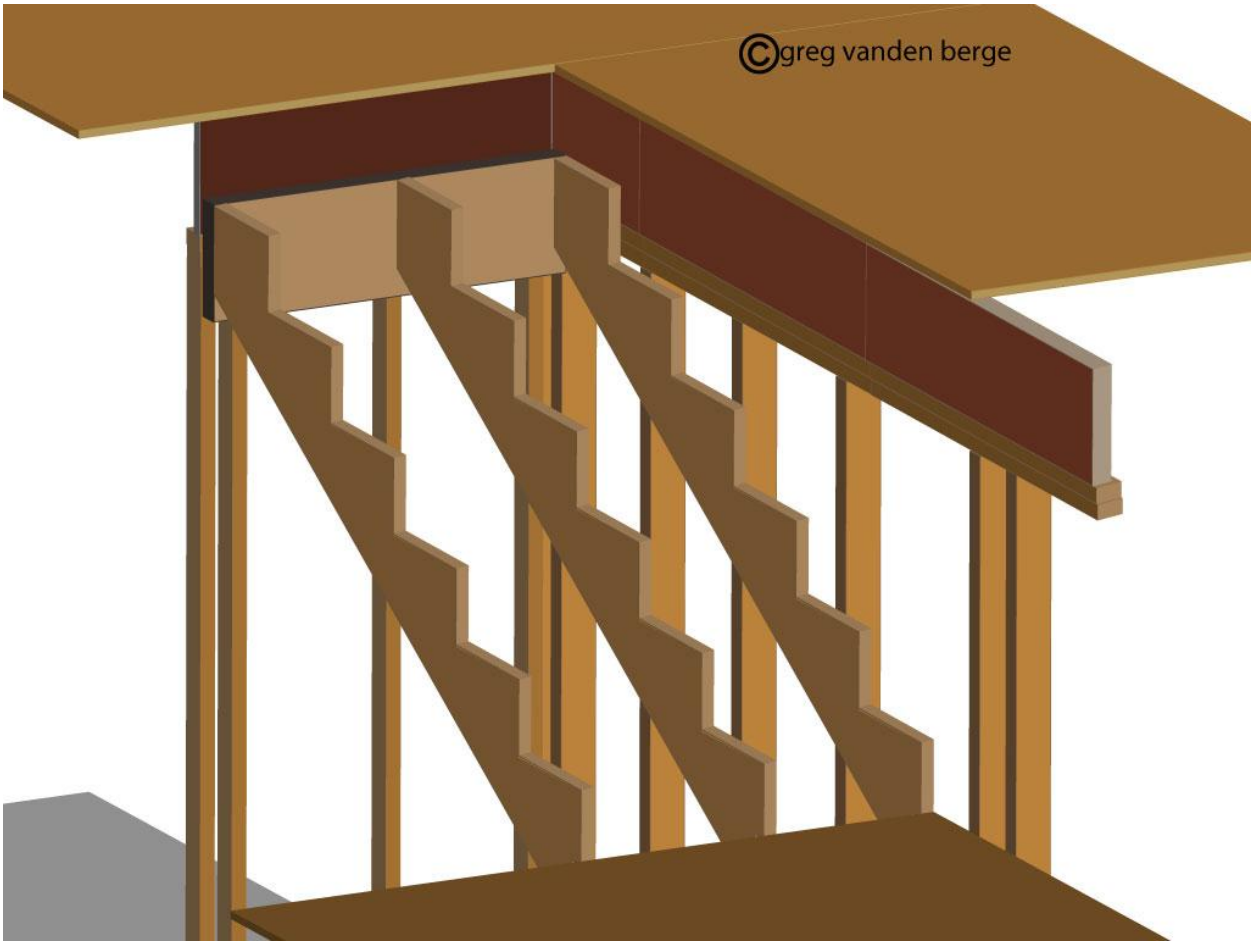


Step 33: When you are done nailing the treads on the lower section of the stairway, you should end up with something similar to the illustration above.

What size nails should I use?

You can use 8d nails for 3/4" thick treads and risers and 16d nails for 1-1/8 inch plywood or construction standard materials that will be an inch and a half or inch and a quarter in thickness, like 2 x 6 or 2 x 12.

I don't recommend using screws, but I will leave that decision up to you.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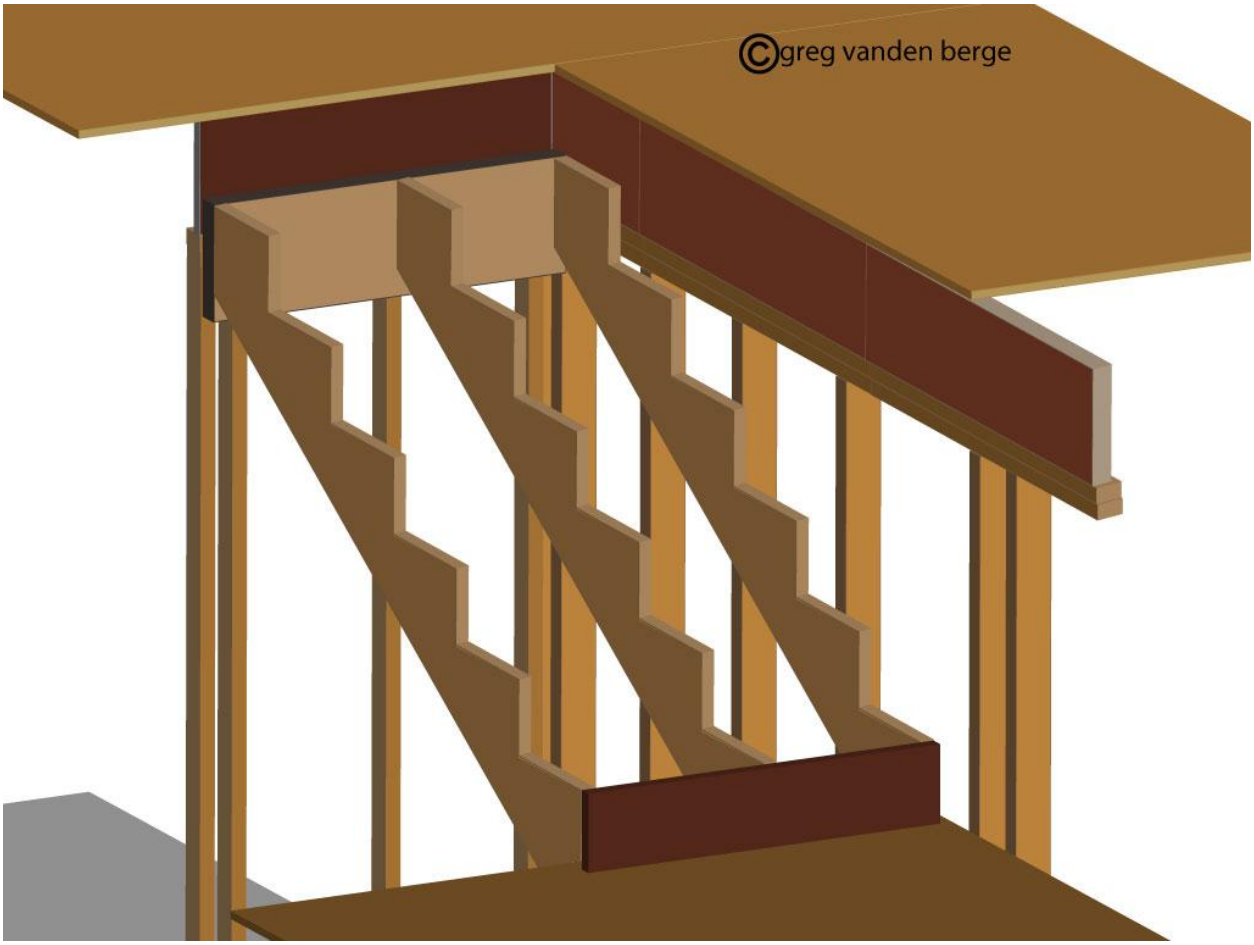
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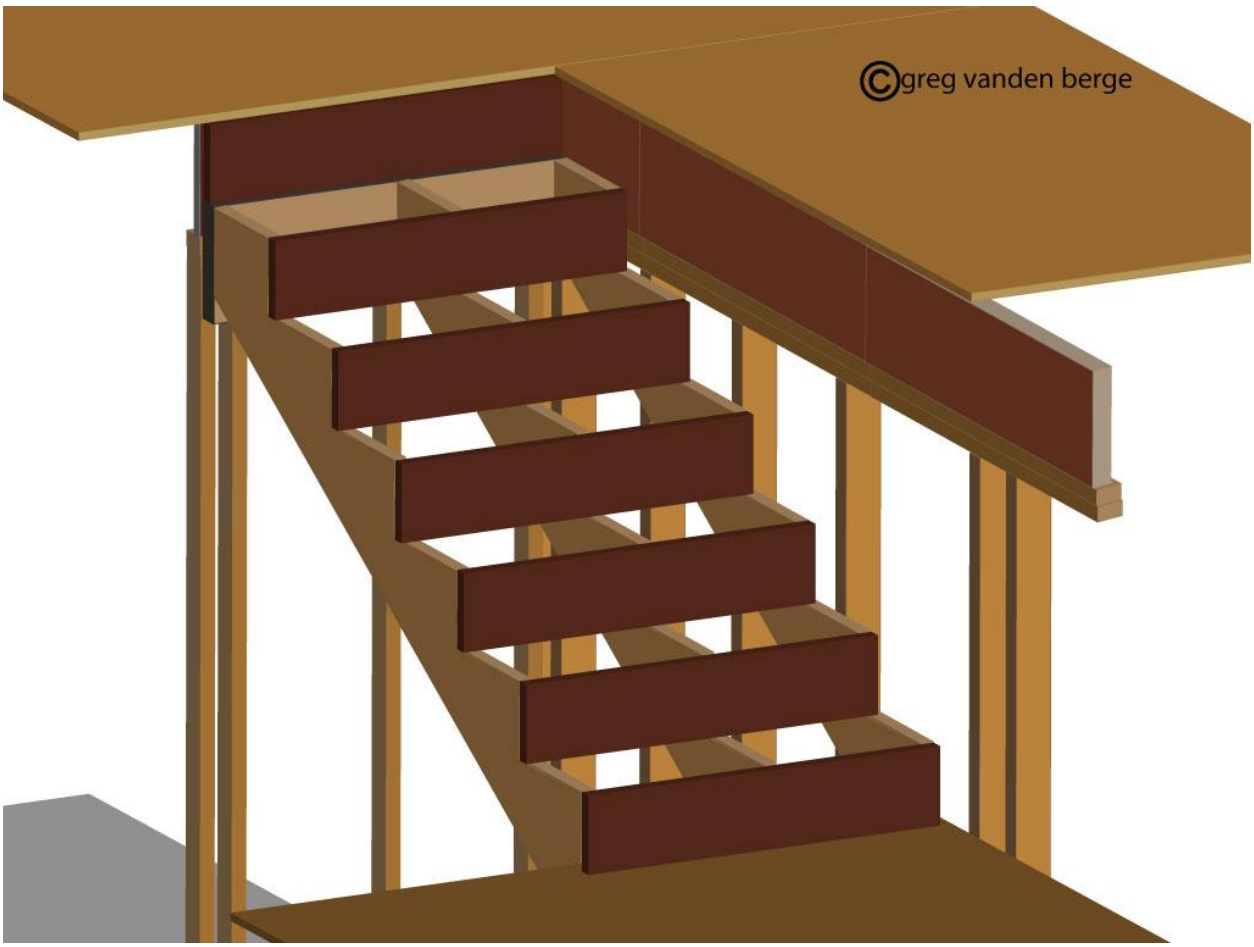
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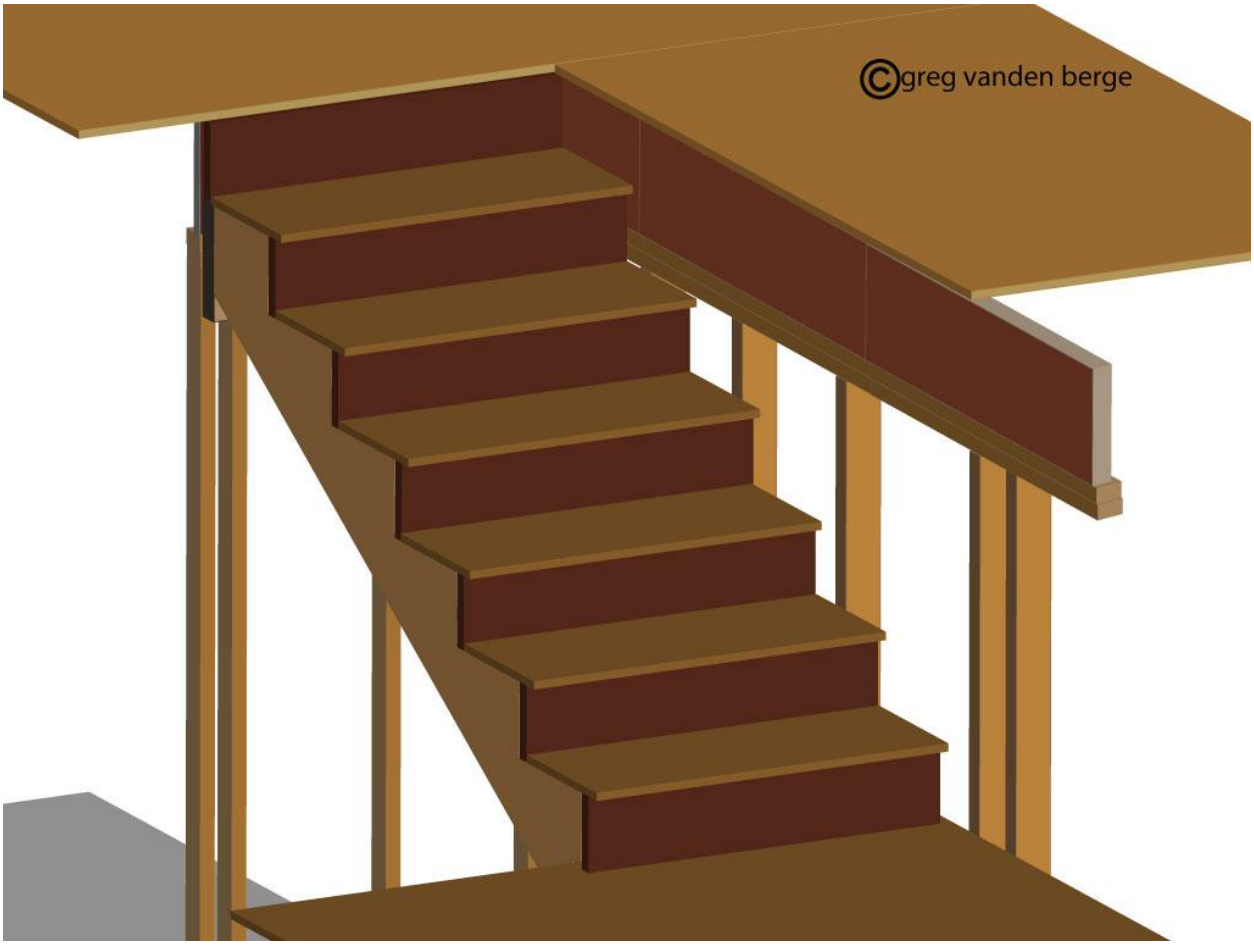
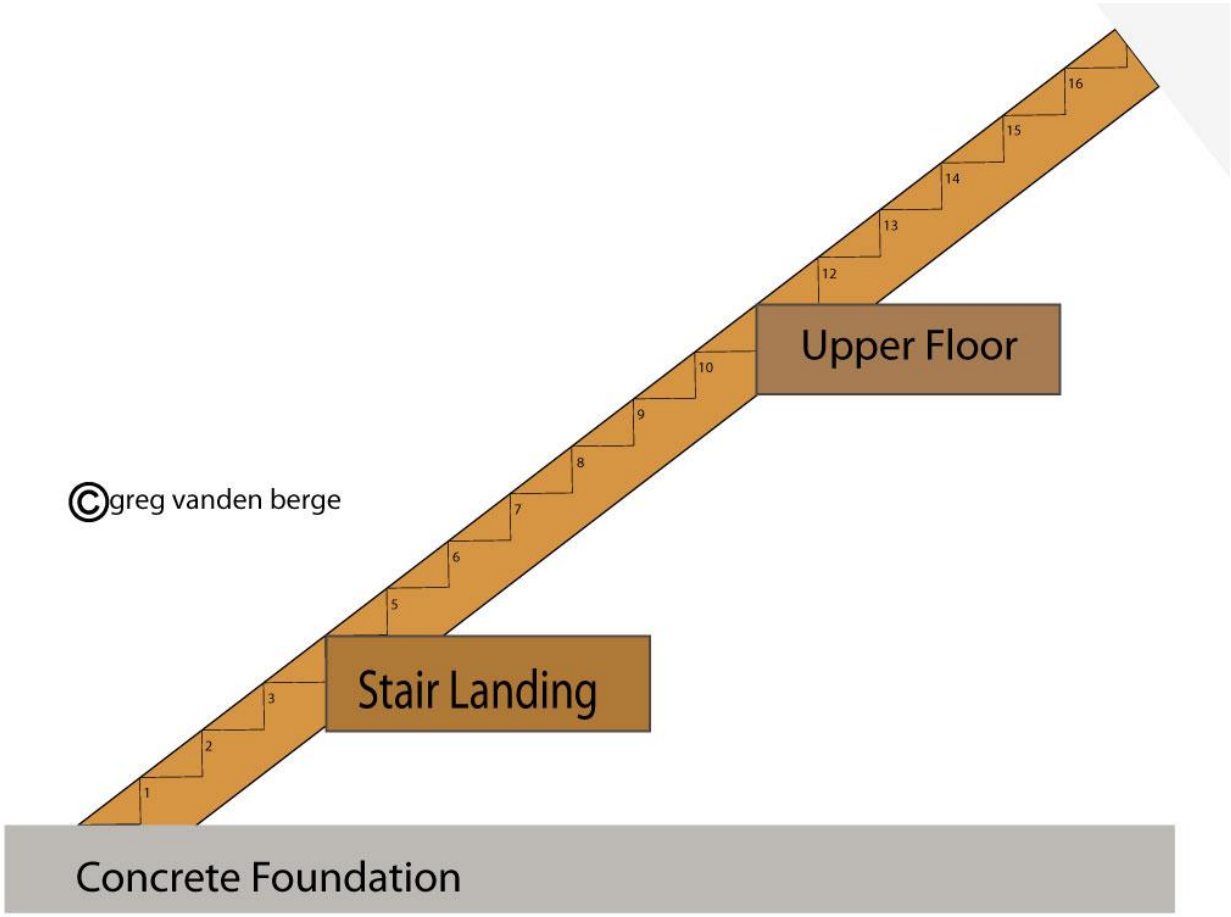


By now you should have a general idea about how these stairs are assembled, but before you layout or cut anything, finish reading the book. You need to understand some of your other options as well as positioning the landing.

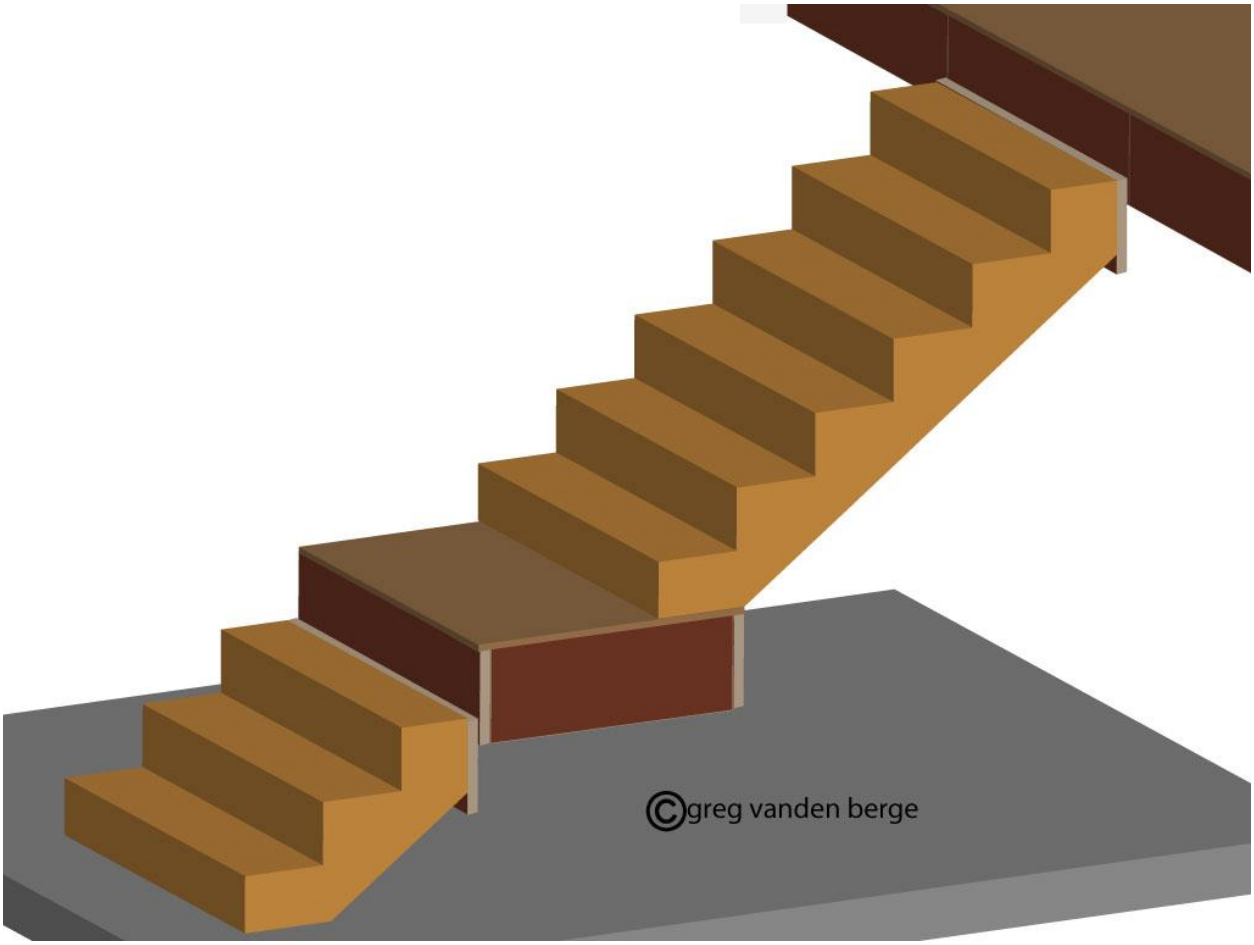
Landing Heights

In this chapter I'm going to provide you with a few different examples of stairs with platforms. Realistically, only the locations of the landings in the illustrations below will have changed, but the process for constructing practically any stairway with a landing will remain the same as those in the previous chapter.

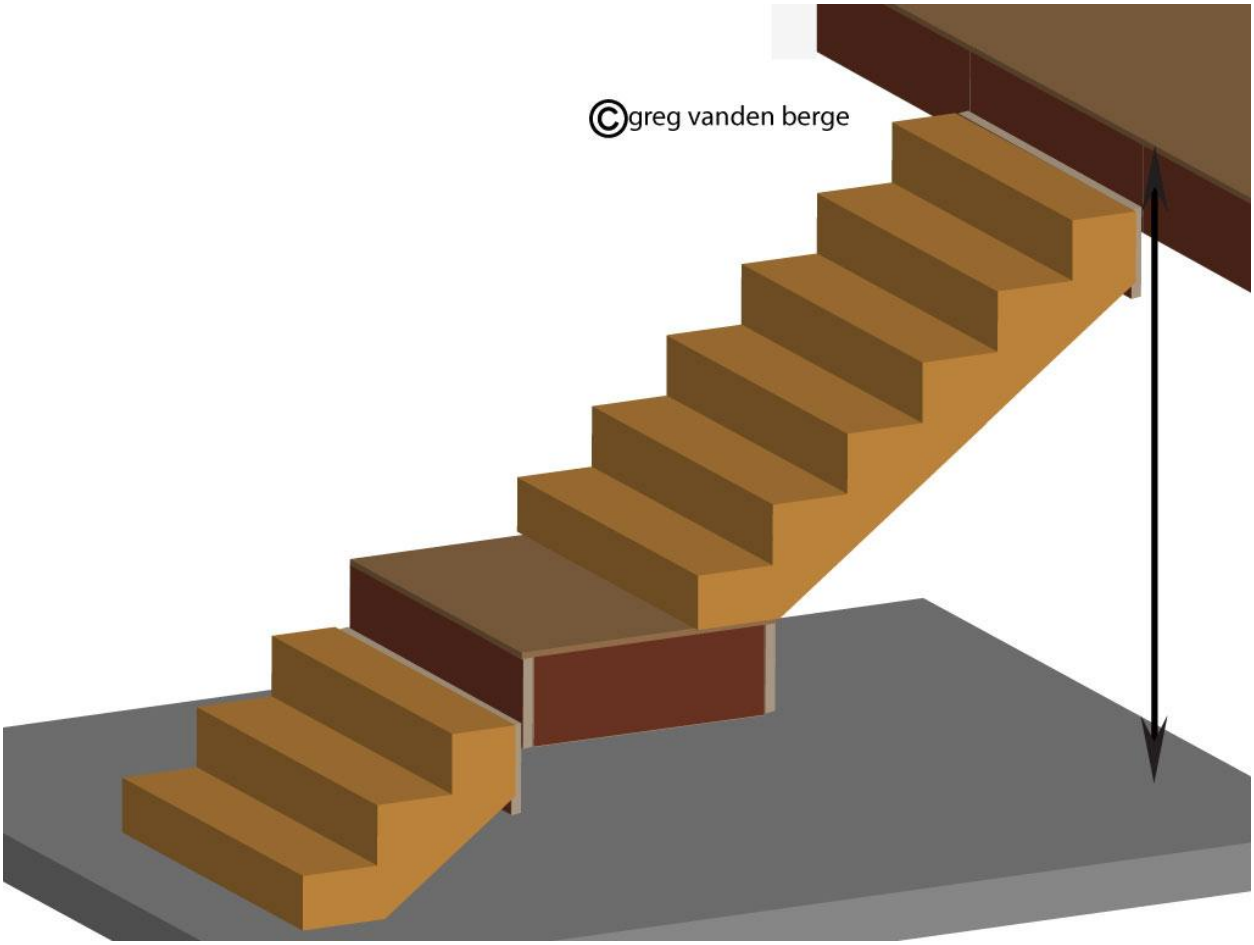


In the illustration above we have three steps leading to our first landing and then another six to the upper floor. The illustration above provides you with an excellent view of where the landing and upper floor will be positioned, while laying out your stair stringer.

Again, the stair building process works best when you can imagine every step of the construction process perfectly in your mind.



Here's a three-dimensional view of the stairway. In this chapter I'm not going to provide you with any walls under the landings or floors. My main concern in this chapter is to provide you with different types of stairways and how the landing locations will be affected.

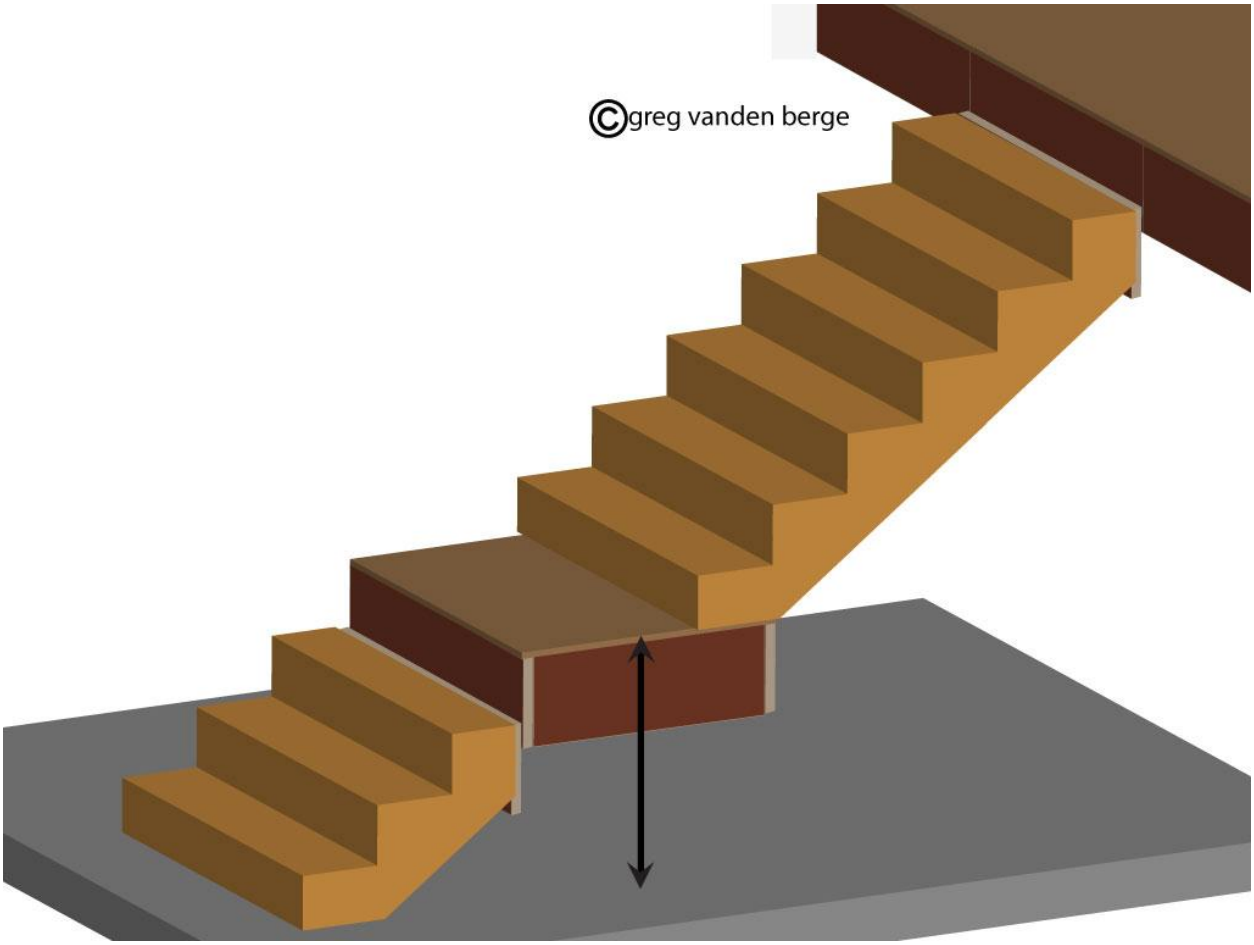


We will be using 7 1/2 inch risers in our examples.

The floor height can be obtained by adding the amount of risers for this particular stairway and multiplying that number by 7 1/2 inches. You would basically reverse this process, to figure out your individual riser height and the amount of risers you would need, before laying out your stair stringers and positioning your landings.

11 risers multiplied by 7 1/2 inches equals 82 1/2 inches.

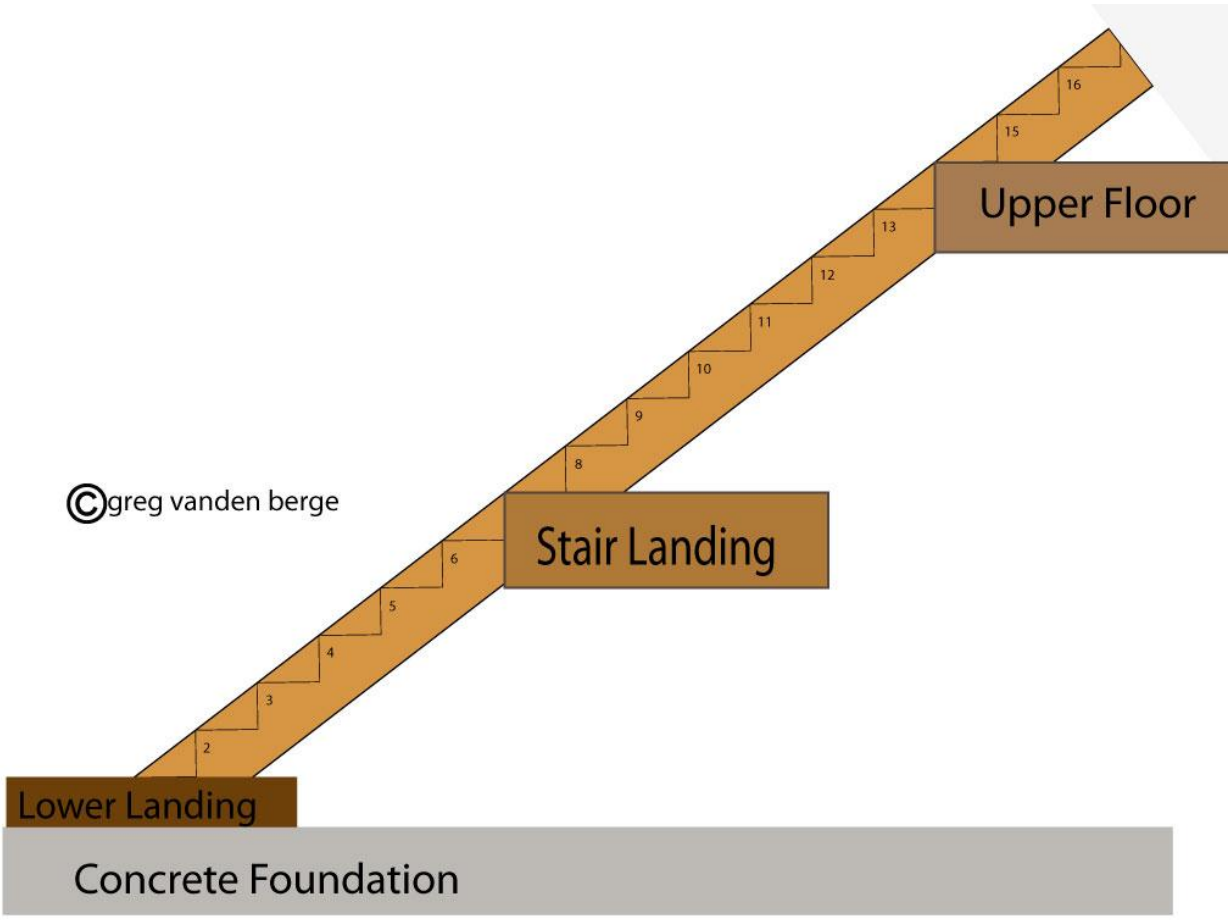
If all I had was a floor height measurement of 82 1/2 inches, but didn't know what type of stairway I was going to build, I could simply start dividing a few numbers into 82 1/2 inches until I arrived at a reasonable individual riser height measurement (Something between 7 and 7 3/4 inches).



To figure out the exact height of the landing, all you need to do is multiply the amount of risers in the lower stairway, by the individual riser measurement.

For example: We have four risers at 7 1/2 inches each and if we multiply these two numbers together, we would arrive at a 30 inch total height, from the lower floor. The measurement from the top of the bottom floor to the top of the landing will be 30 inches.

7.5 x 4 = 30

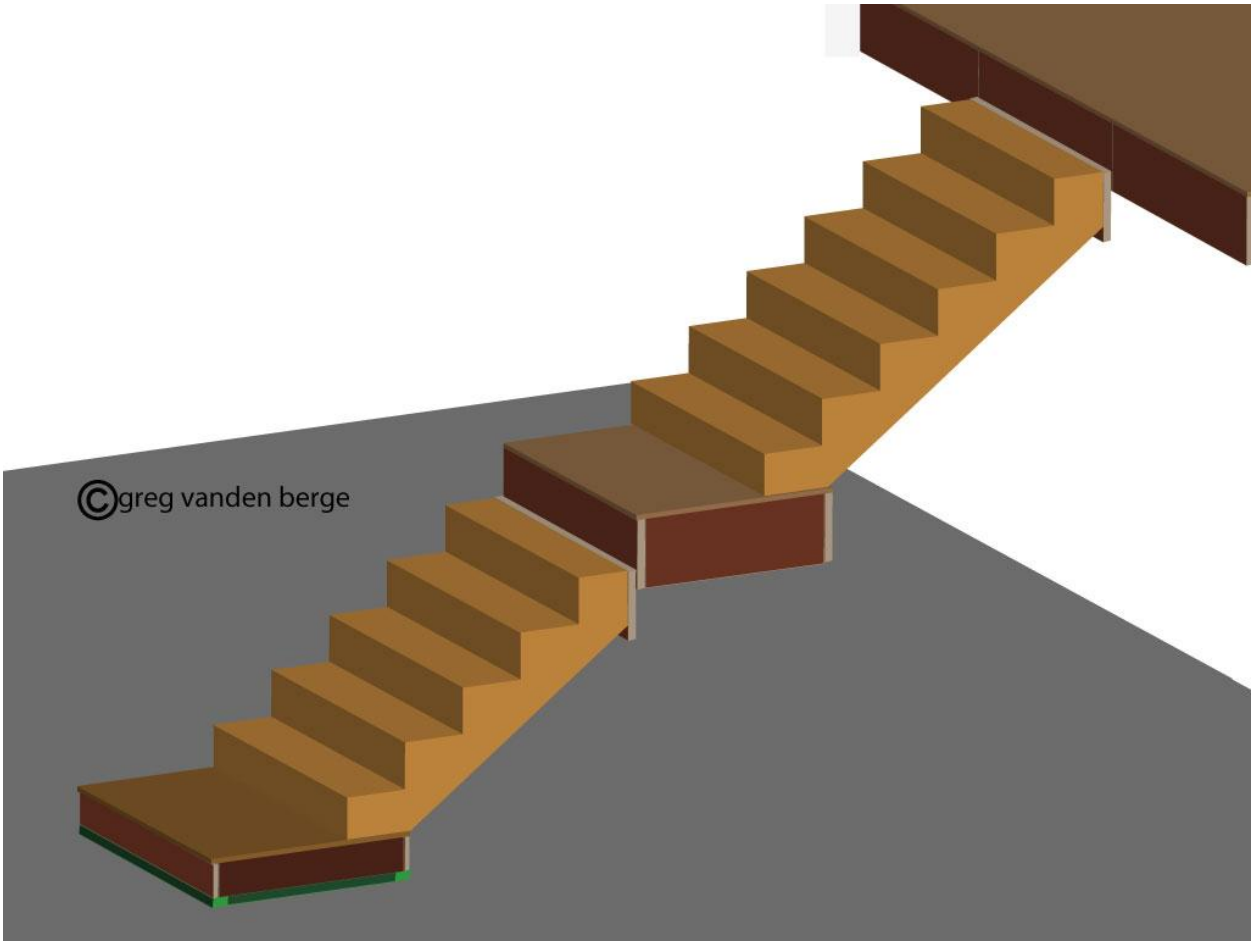


In this example we have a lower landing that will need to be built to the same height as our individual riser measurement. Then we have five steps leading up to a landing, then another six steps leading up to the upper floor.

The overall height of the lower landing will be 7 1/2 inches in this particular example. If necessary you will need to use different sized materials or even rip down each landing joist, in order to arrive at this particular measurement.

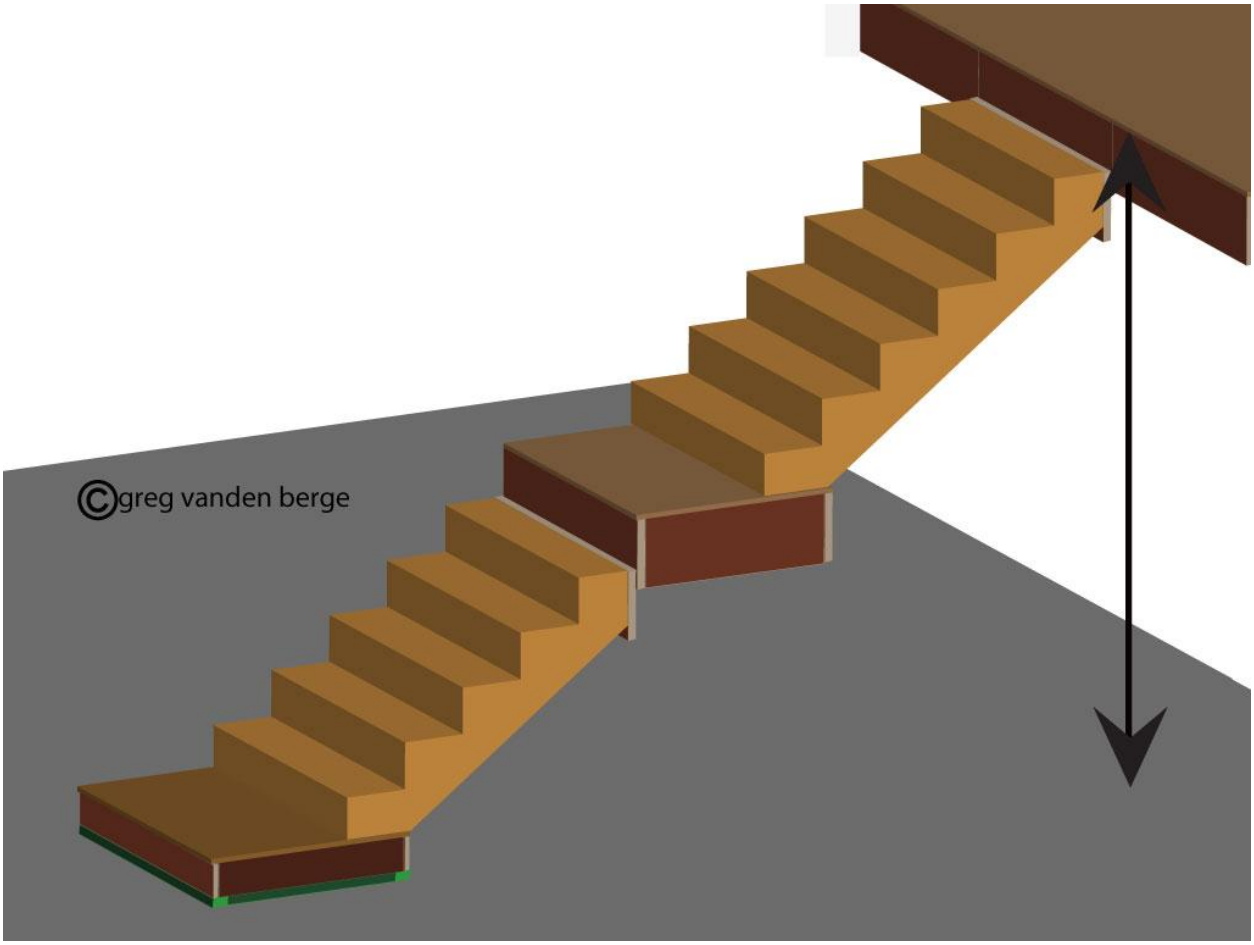
For example: If I use an inch and a half thick base plate (2x4) and then set 2 x 6 joist on top of those plates, then install 3/4" plywood sheathing on top of the joist, I would end up a landing between 7 3/4 and 8 inches in height.

In order to solve this problem, I could use different sized base plates or rip the joist down from 5 1/2 to 5 1/4 or even 5 1/8 inches.



Here’s an illustration and three-dimensional view of this particular stairway. You can clearly see the landing at the bottom and this illustration might even give you a better idea about how it's constructed.

The green lumber represents treated lumber and it won't be necessary, if the stairway is constructed on top of a wood framed floor or deck.

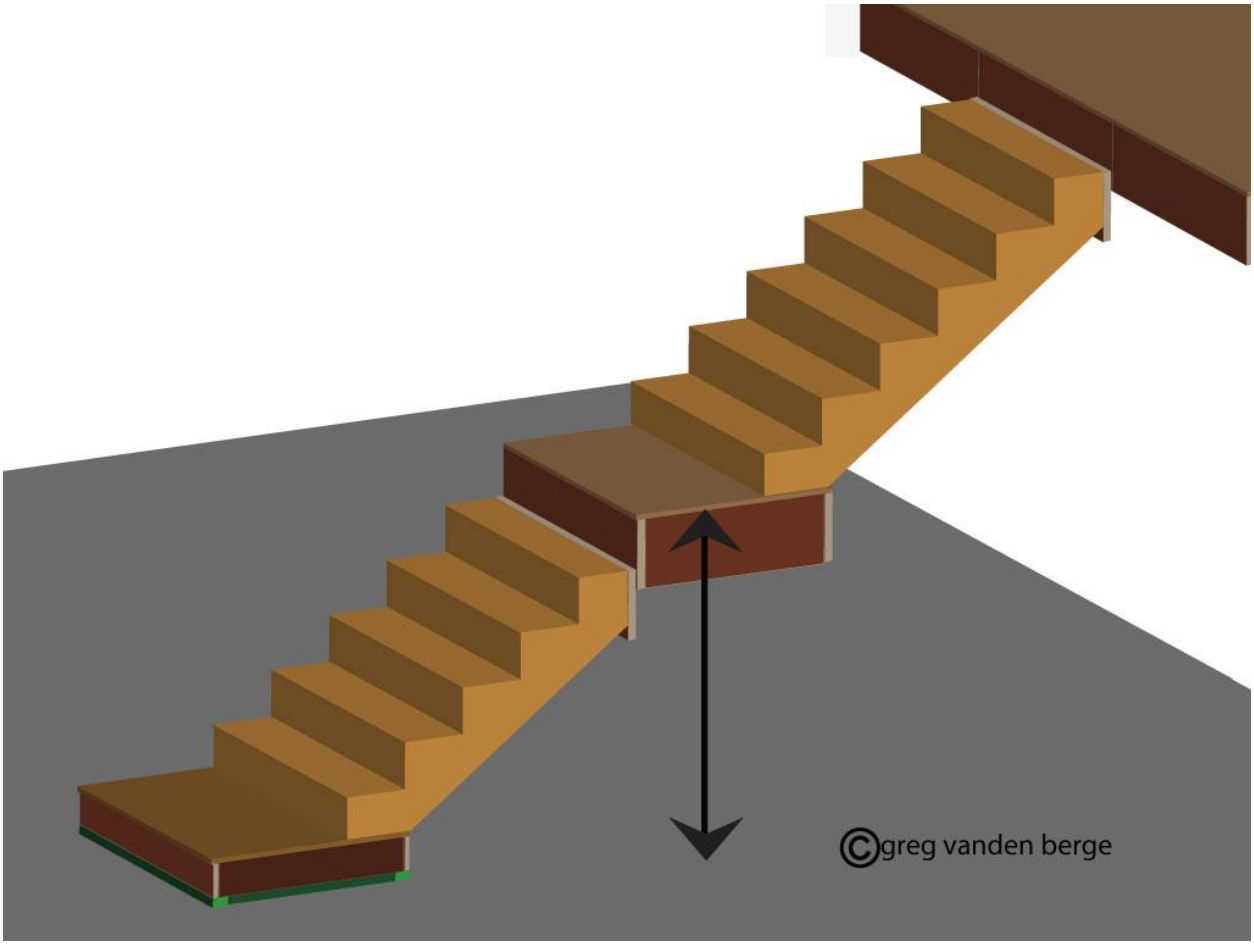


In this illustration we have 14 individual risers with a 7 1/2 inch overall individual riser measurement. If we multiply 14 x 7.5 inches then we will end up with a total overall rise of 105 inches.

Let's just say, to mix things up a bit here, the total riser measurement in between floors is 107 inches. We thought it was going to be 105 inches, but it ended up being 107 inches.

If this is the case then simply divide 14 into 107 inches. This would provide us with a 7.64 or 7 5/8 inch individual riser measurement. You will need to compensate for certain building materials and unforeseen circumstances and should always be prepared for the worst.

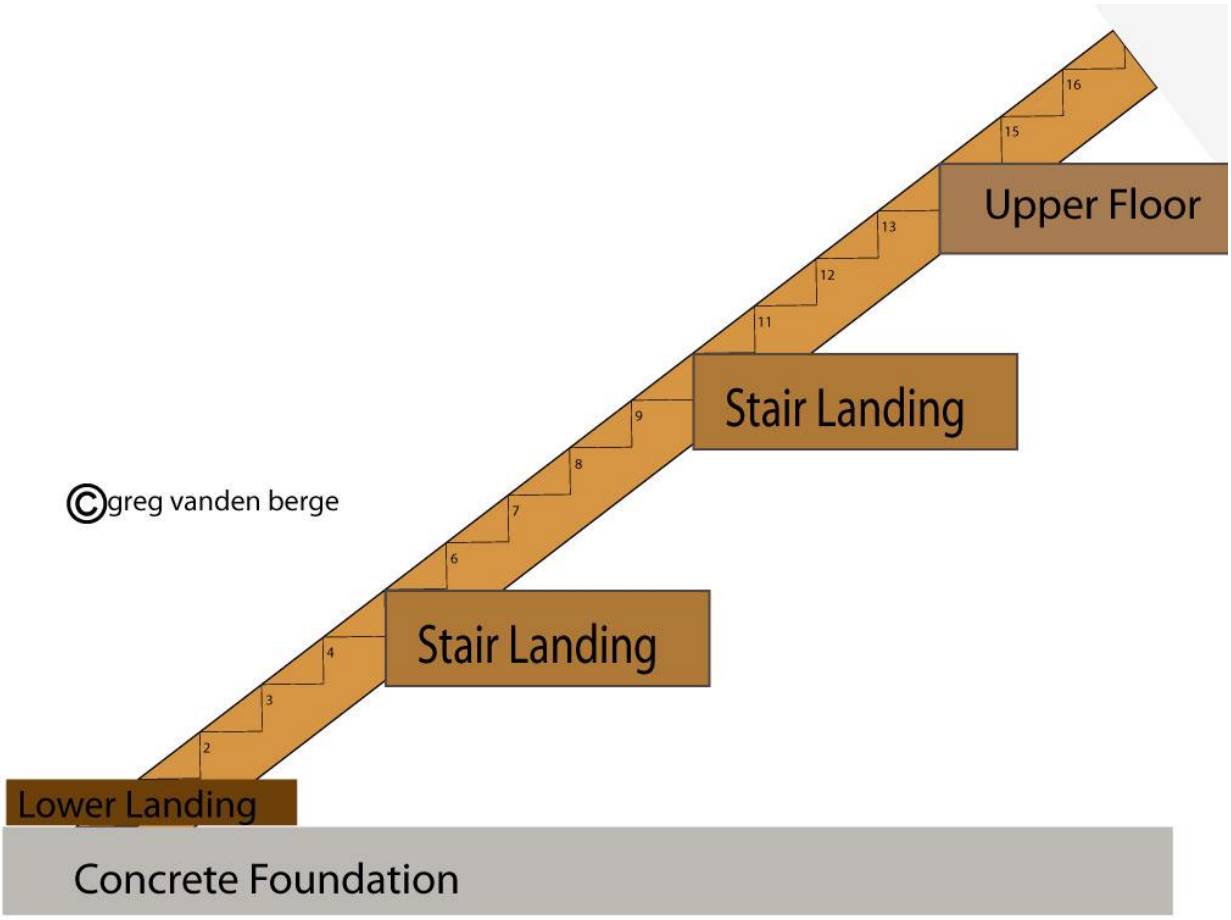
It isn't a bad idea to wait until the upper floor is built or framed, before laying out your stair stringers, just in case there are any unexpected variations in the building materials you're planning on using.



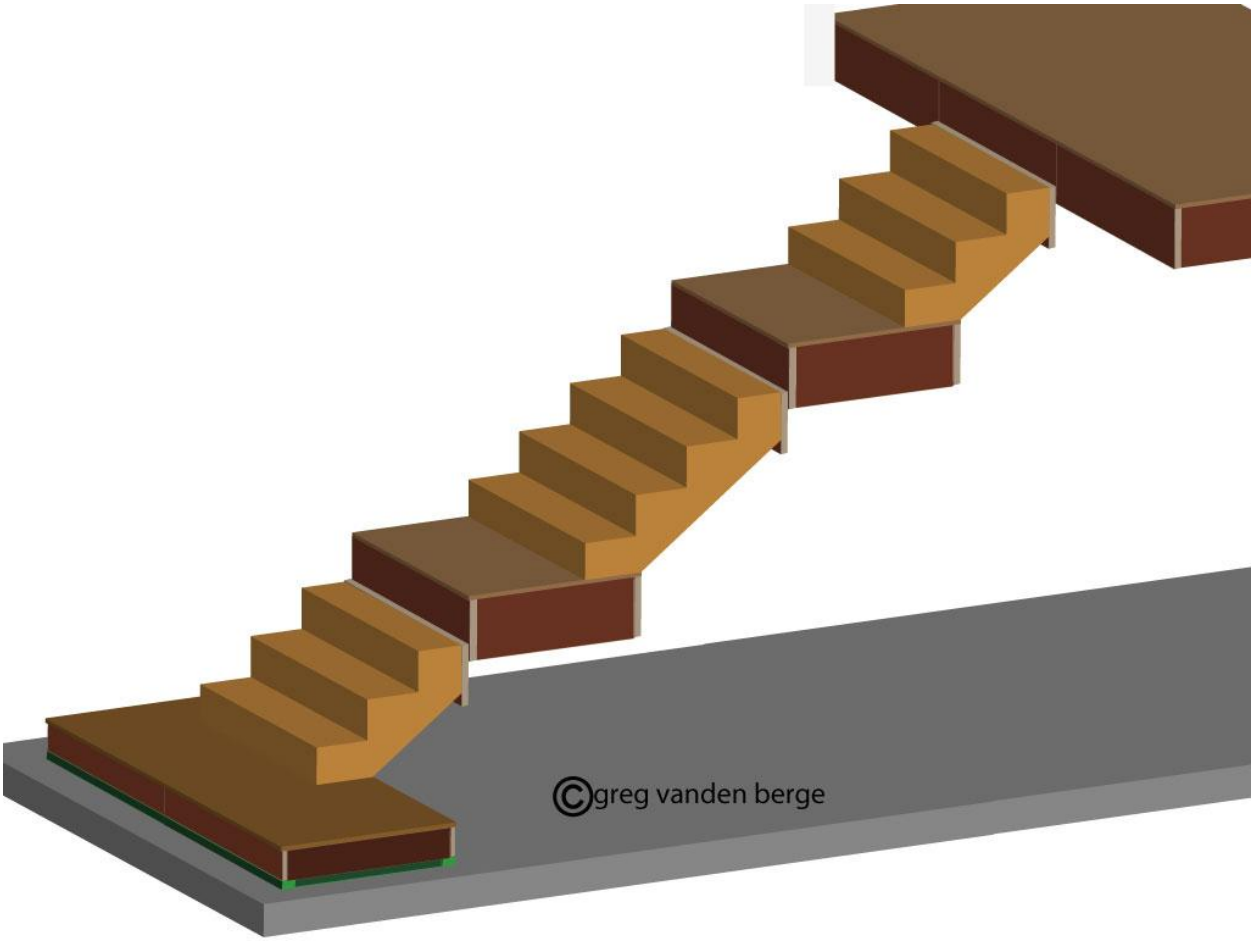
There are seven individual stair risers leading up to the landing. In order to figure the overall height and vertical position of this particular landing we will need to multiply the seven individual stair risers by 7 1/2 inches, which gives us a 52 1/2 inch overall height.

If you were building the same stairway, but had 7 inch individual riser height measurements then you would simply multiply the seven individual stair risers by the overall individual total riser measurement, ending up with a total landing measurement height of 49 inches.

By now you should have a general idea how to figure vertical stair landing heights, however I'm going to provide you with one last example, if it isn't crystal clear yet.

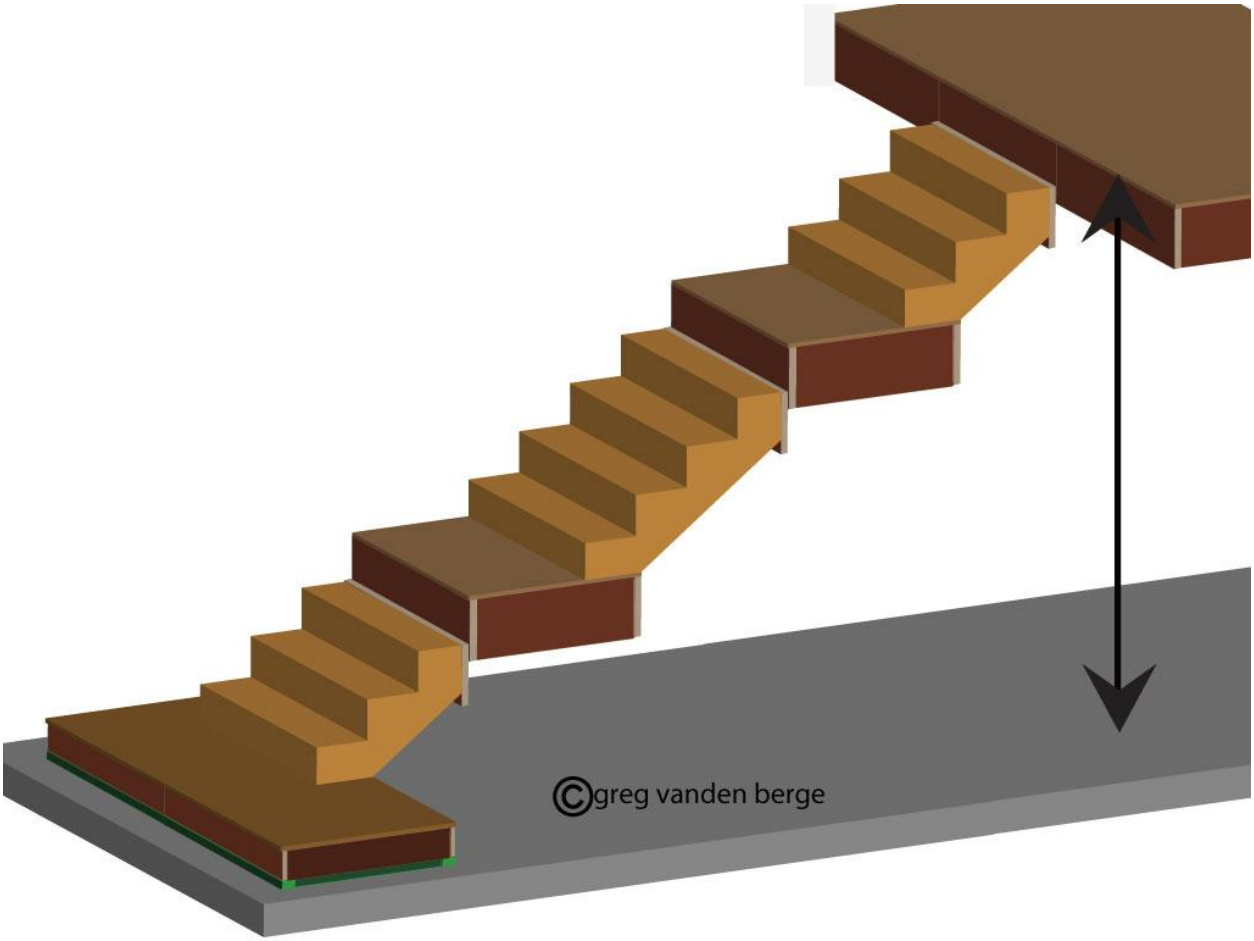


In this example we have a lower landing, then three steps to a second landing, then four steps to a third landing, followed by another three steps to the upper floor.



Here's a three-dimensional drawing of what the stairway would look like if the stairs and landing were positioned in a straight line. Don't forget, you can turn or rotate the landings and stairways at 90°, 180° or practically any other angle needed, to accommodate your particular stairway design.

In other words you could go up three steps to a landing, turn to your right or left at a 90° angle and then go up another four steps only to turn again to your right or your left at another 90° angle and of course do the same until you reach the upper floor, for the rest of the stairway.

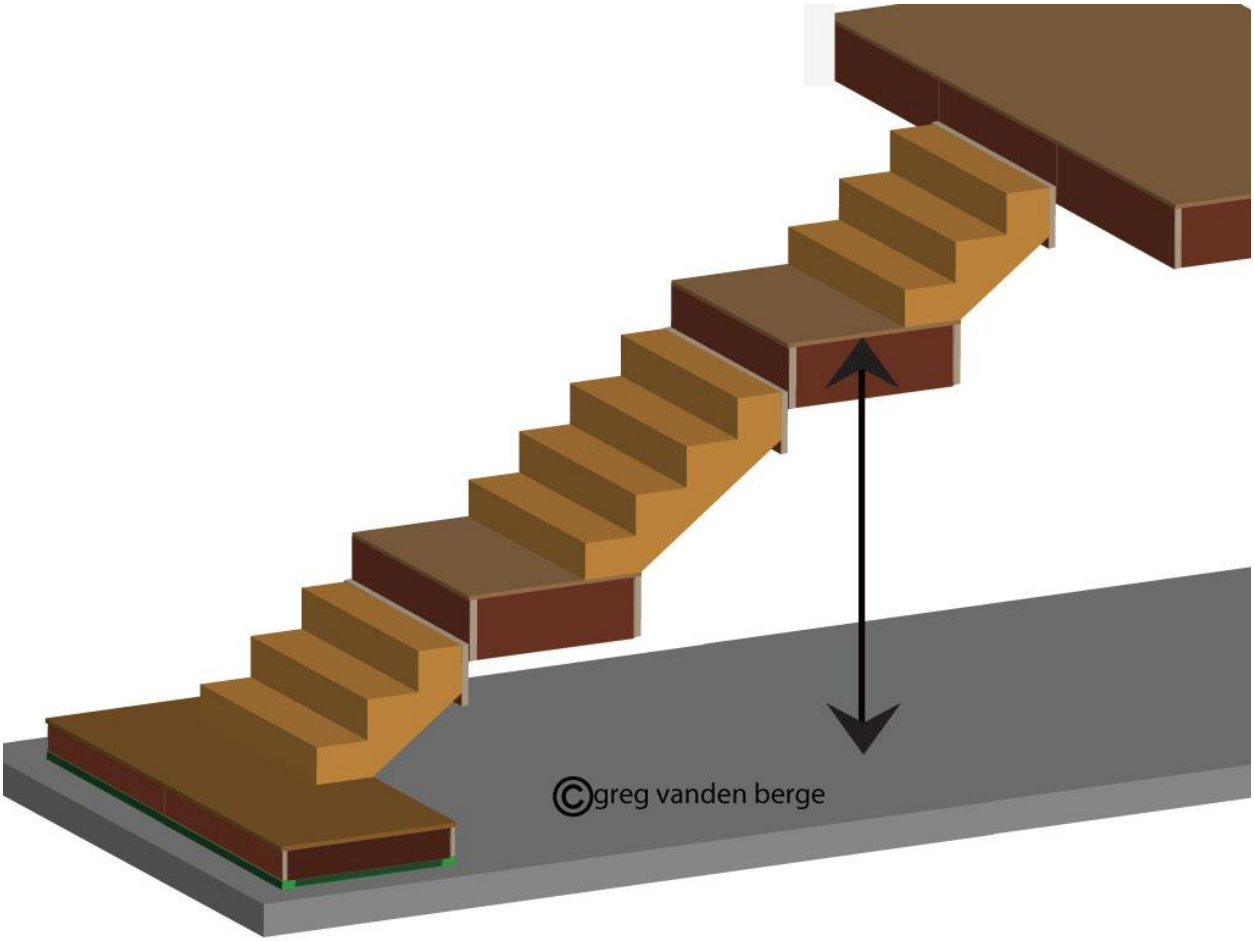


In this illustration we have an overall rise of 105 inches. In order to figure out where our landings go exactly we will need to divide the individual riser height measurement into 105 inches.

Simply take 14 individual risers and divide this number into the overall height between floors. 14 divided into 105 inches leaves us with 7.5 or 7 1/2 inches.

7 1/2 inches represents the distance in between each vertical (up and down) step for the entire stairway. Again, in order to figure out the vertical position of any landing, simply multiply the amount of individual risers leading up to the landing by the individual riser height.

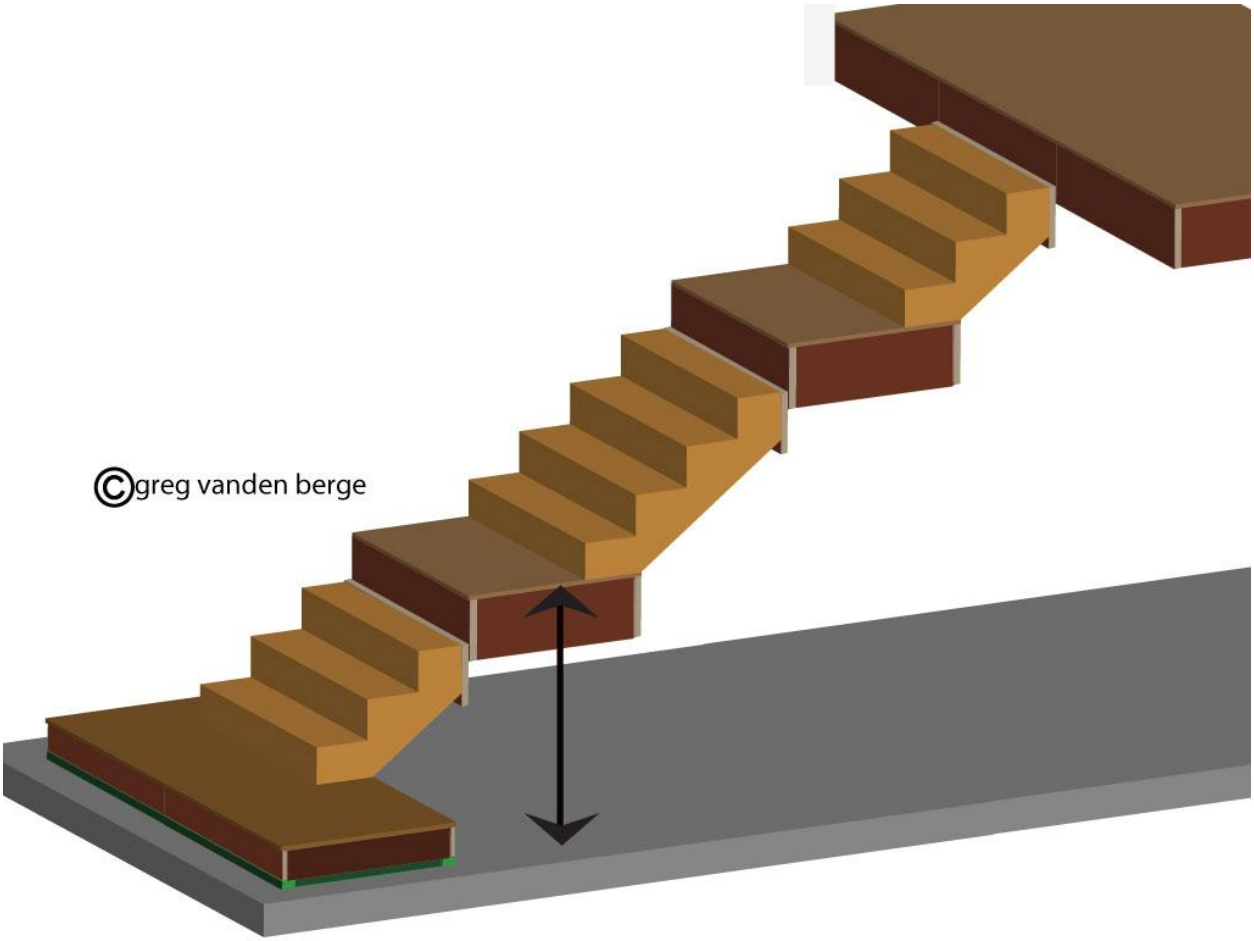
All you're doing is dividing the horizontal and vertical distance with individual steps and landings, to arrive at your final destination, the upper floor.



Again, simply count the amount of risers leading up to the third landing. In this case we have 10 individual risers, then multiply that number by 7.5 (the decimal for 7 1/2 inches).

10 x 7.5 = 75 inches.

Remember, these are the overall landing height measurements not the landing framing or wall heights. Top of the bottom floor to the top of the landing floor.

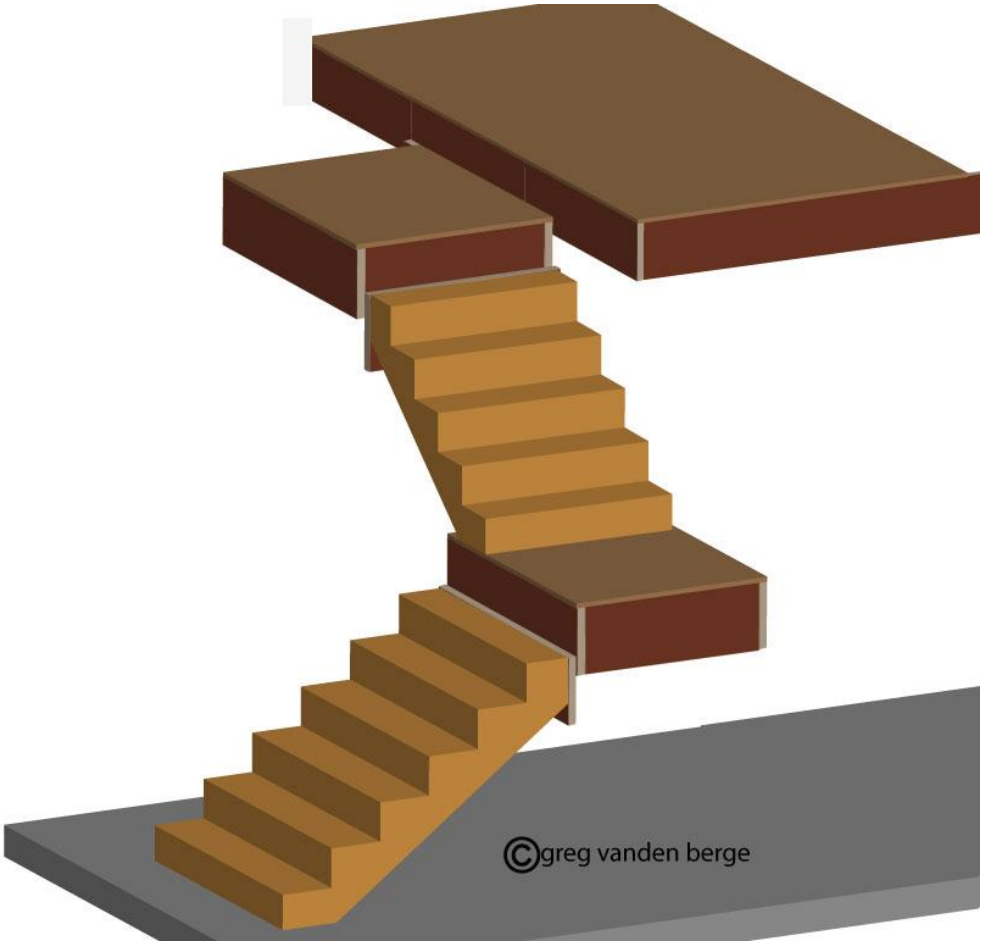


The second landing in the illustration above has five individual risers leading up to the landing. The first riser would be represented by the lower landing, followed by three additional steps or four risers leading up to the second landing.

Five times 7.5 equals 37 1/2 inches.

5 x 7.5 = 37.5 inches

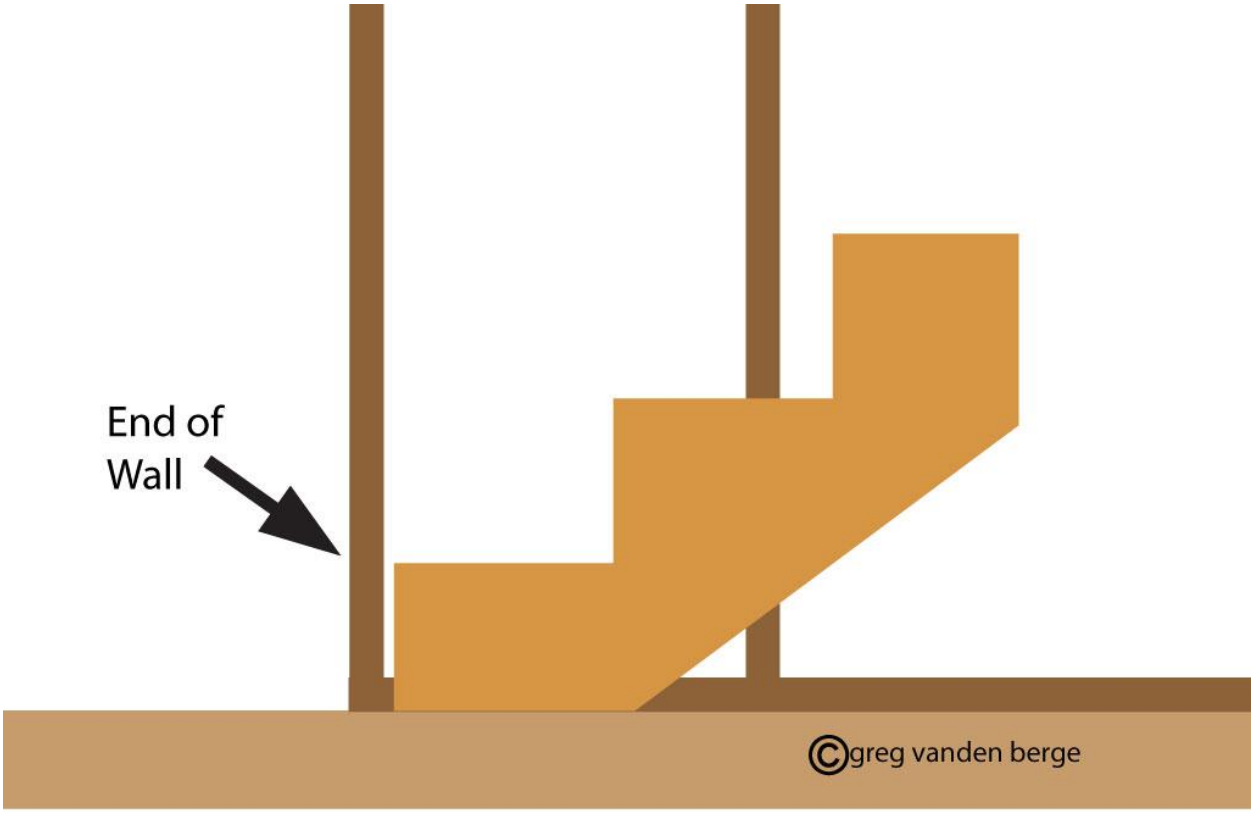
Five risers multiplied by 7 1/2 inches equals 37 1/2 inches



In this illustration I rotated the upper stairway 90° so if you were walking up the lower stairway, you would turn to your left at a 90° angle and continue walking up to the last landing, before turning right and taking your last step, on to the upper floor.

The previous illustrations and examples of landing height measurements can be applied to practically every set of stairs with a landing, no matter which way they turn.

Horizontal Landing Location

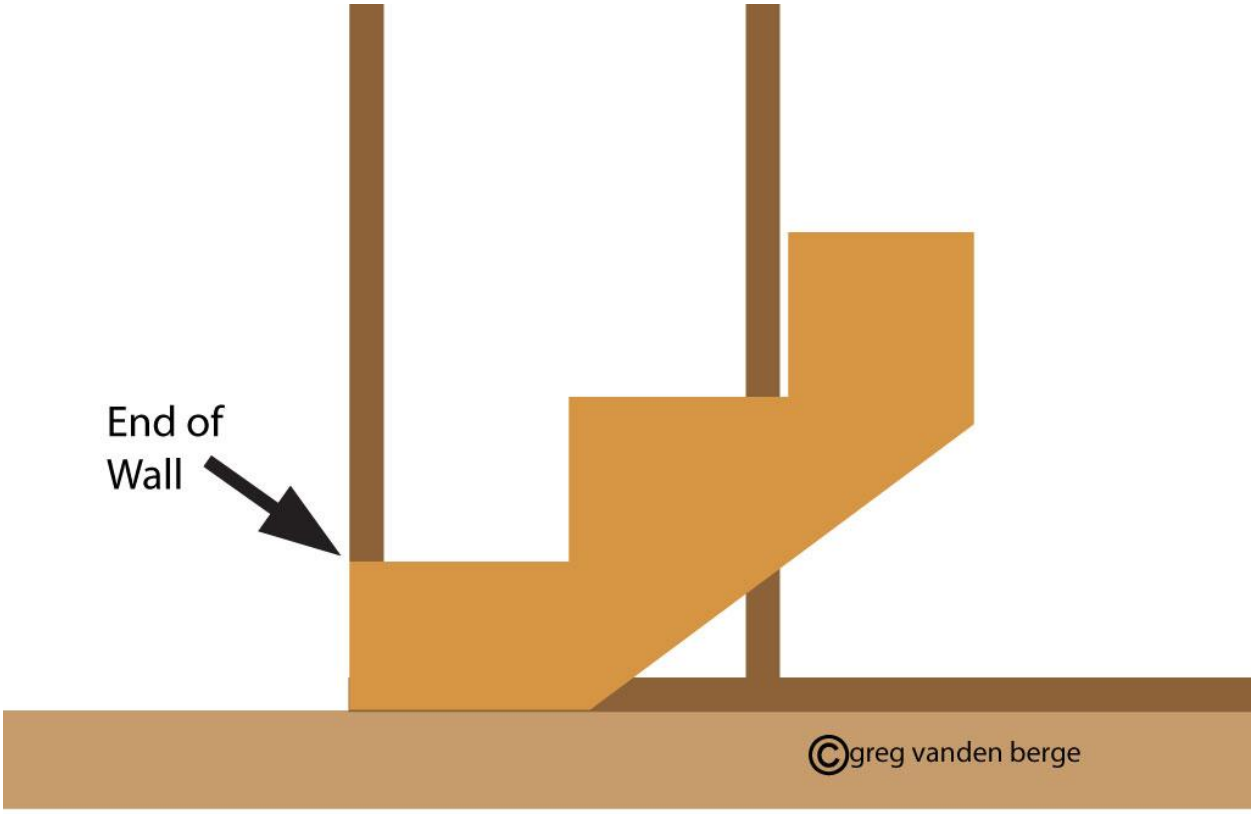


Before you can figure out where the landing needs to be positioned, you need to understand where the stringer needs to be positioned. We're going to take a look at a few different examples of the biggest problems I've seen with stairs being built today.

I can't tell you how many times I've ran across a stairway, where the bottom step is sticking into either a landing or a hallway, more than it should be.

In this example I moved the stringer back about 2 inches and will be able to adjust the horizontal location of the stair landing, in order to prevent the lower stair step, from sticking out into the hallway or past the wall.

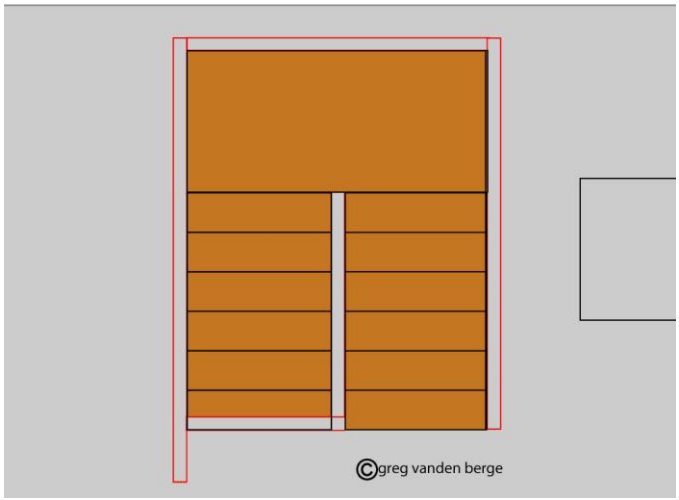
http://2.gregvan.com/images/framingideas%20201.jpg

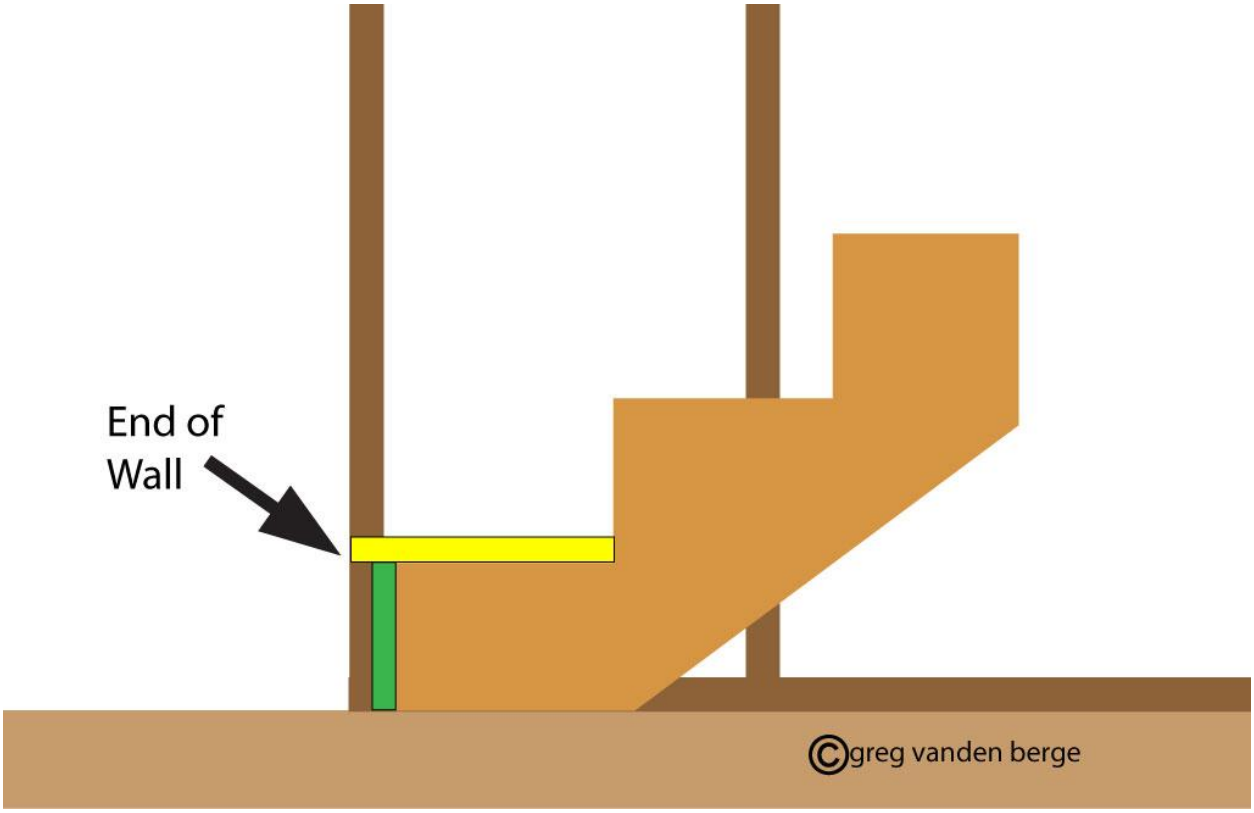


In the illustration above the stair stringer lines up perfectly with the wall, even though we haven't installed the treads and risers. This is actually what the stairway would look like if you laid everything out according to the floor plan, in the illustration below.

You can clearly see the front of the lower stair tread lines up perfectly with the hallway wall.

If you simply measured from the front of the hallway wall back 60 inches (stairway run), without deducting for the tread overhang and riser, then the bottom step will protrude past these walls.



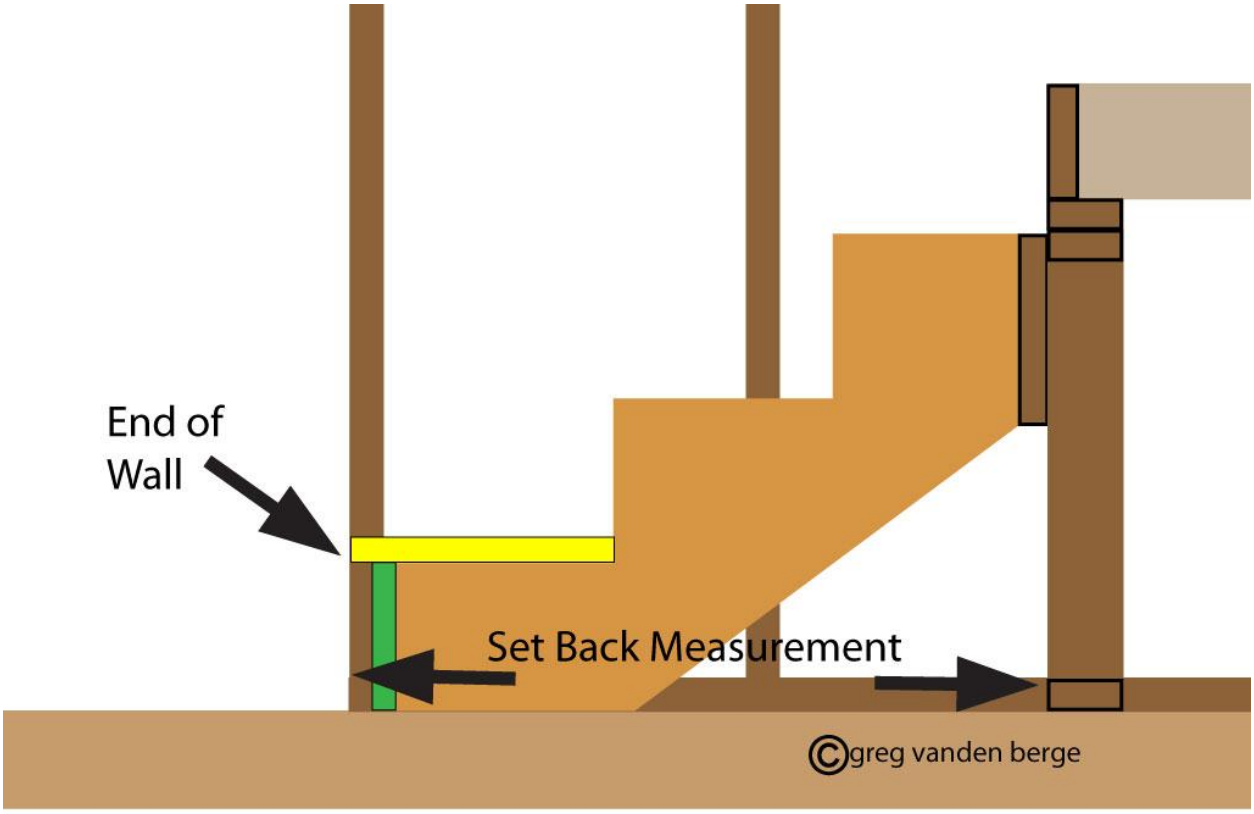


In the illustration above, the front stair tread lines up nicely with the end of the wall. However, the wall hasn't been drywalled or plastered yet and the carpeting or other stairway covering materials could create additional problems.

If you're going to use thicker stair tread and riser materials to cover your stairway, then you should think about moving the stair stringer back even further. The same would apply to thinner materials and moving the stairway forward.

By now you should have a pretty good idea how important the location of your stair stringer and landing actually is. The key to building anything correctly is understanding as much as you possibly can about the item you're planning on building.

Like I said earlier, I can't tell you how many times I've ran into a situation where the stairs weren't built correctly, because the stair builder didn't understand this concept.

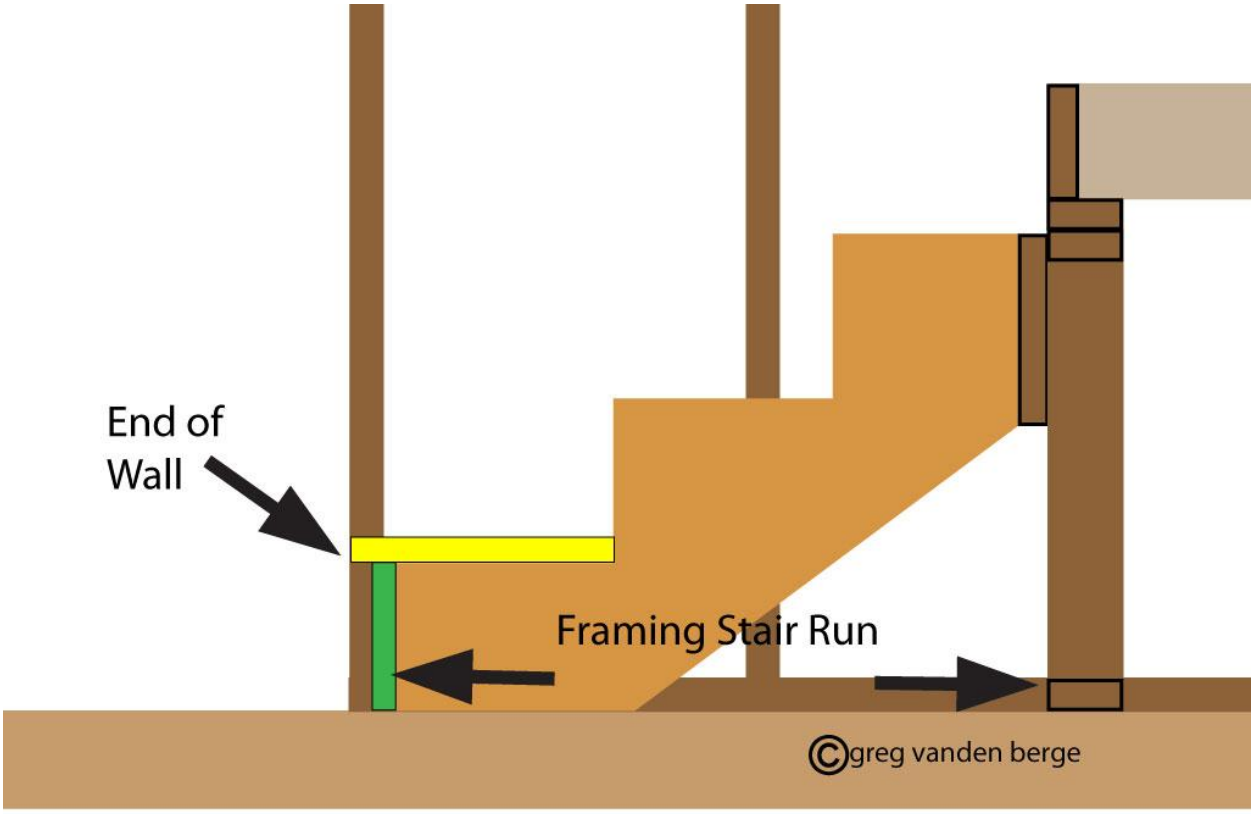


The setback measurement in the illustration above would be 32 inches.

We have three steps at 10 inches each, giving us 30 inches. Then we need to add 2 inches to compensate for our stair tread overhang and riser thickness.

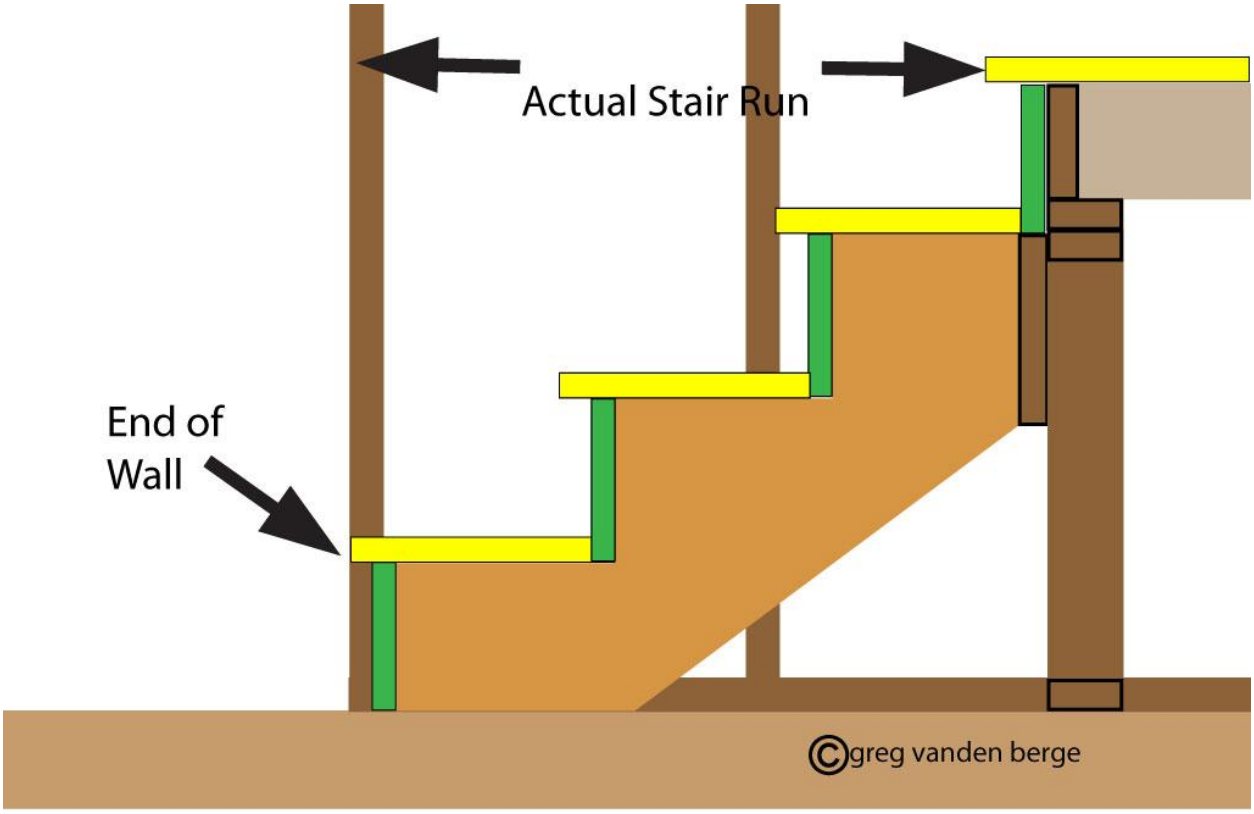
In the example above I'm using a 3/4" thick stair riser, with a 1 inch overhang on the stair tread. If we add these two numbers together, we end up with an inch and three quarters.

If you were going to use an inch and a half thick stair riser then you would need to add an additional three quarters of an inch, to the setback measurement. This would provide you with a 32 1/2 to 33 inch setback.



The illustration above provides you with an excellent example of the original framing stairway run. Again, 3 - 10 inch treads provides us with a stair run equaling 30 inches.

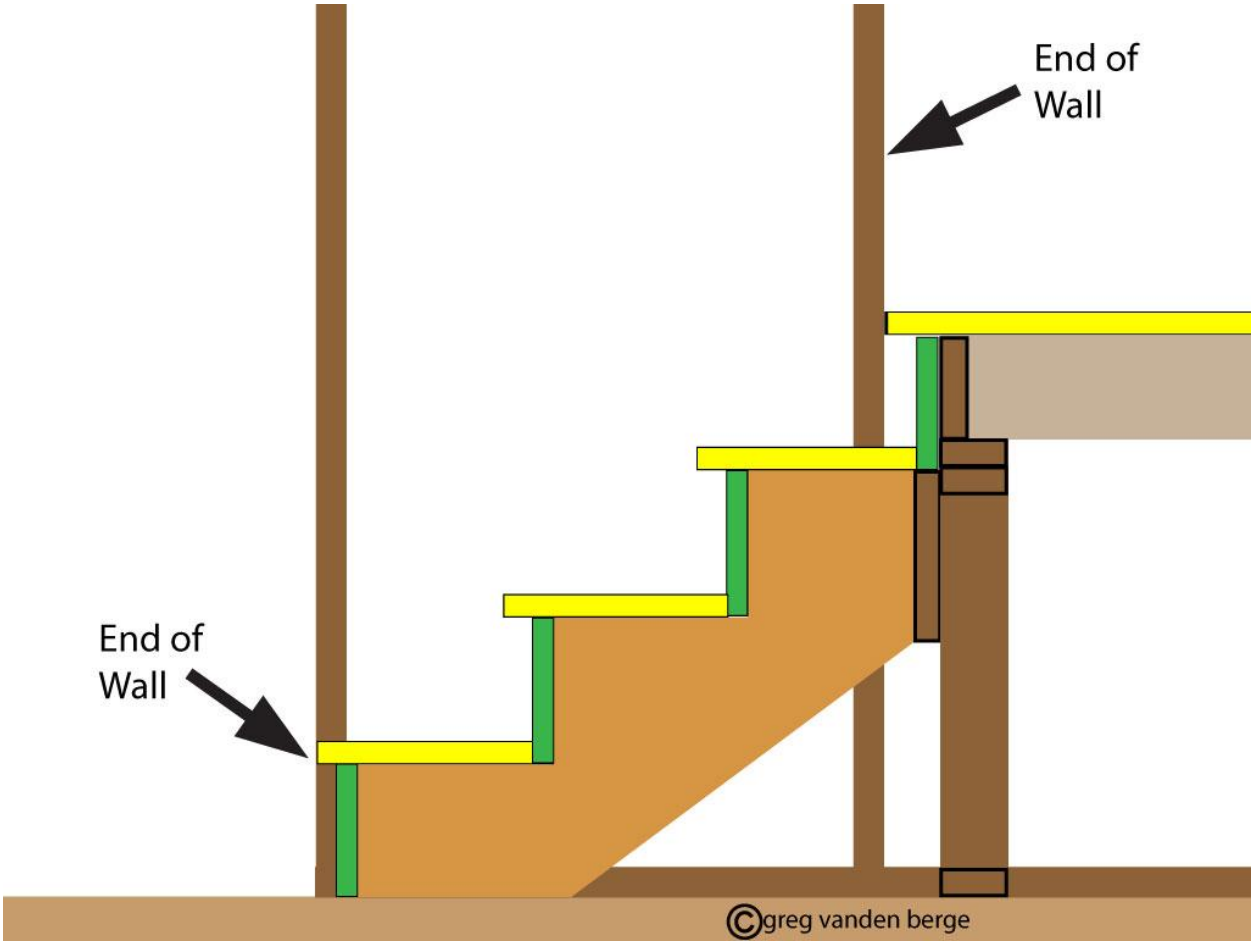
The framing stair run will usually be located in a different position as the final stairway run. Again, and I can't say this enough, you need to understand the exact positioning of each rough framing member (stair stringers, landings, walls and joist) in order to end up with the finished stair treads, risers, nosing, overhang or even undercuts, exactly where they need to be positioned.



The illustration above provides you with the finished product and the actual stair run. If we move the landing to the right, then the entire stairway will move to the right also.

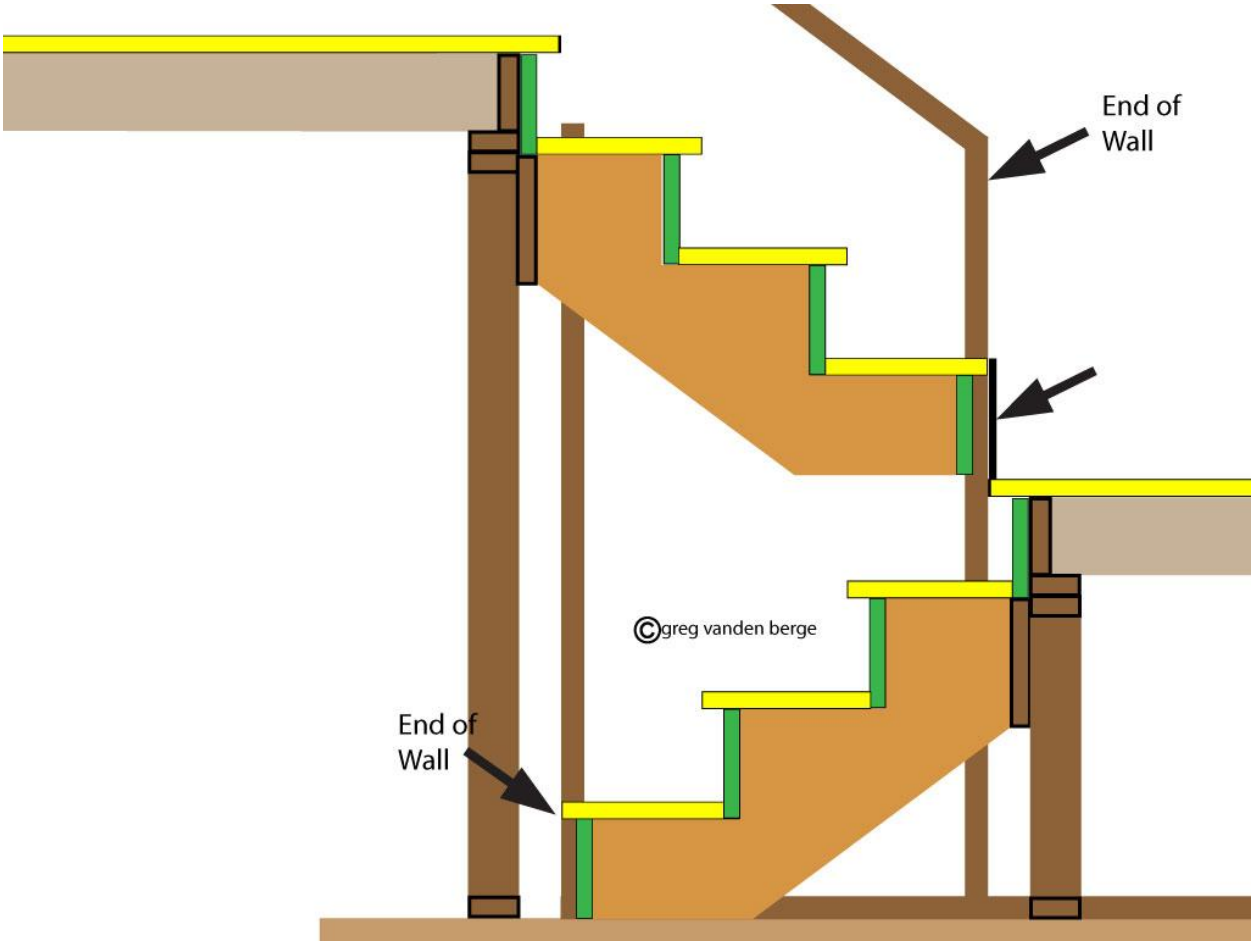
If we move the landing to the left than the entire stairway will also move to the left. Obviously this is common sense, but whenever we move the stairway in either direction, it's going to affect other parts of the building and if you haven't compensated for those measurements precisely, you could be in trouble.

When we move something on the bottom, it could affect something on the top.



The illustration above provides you with the ends of two walls and how their locations affect the finished stairway.

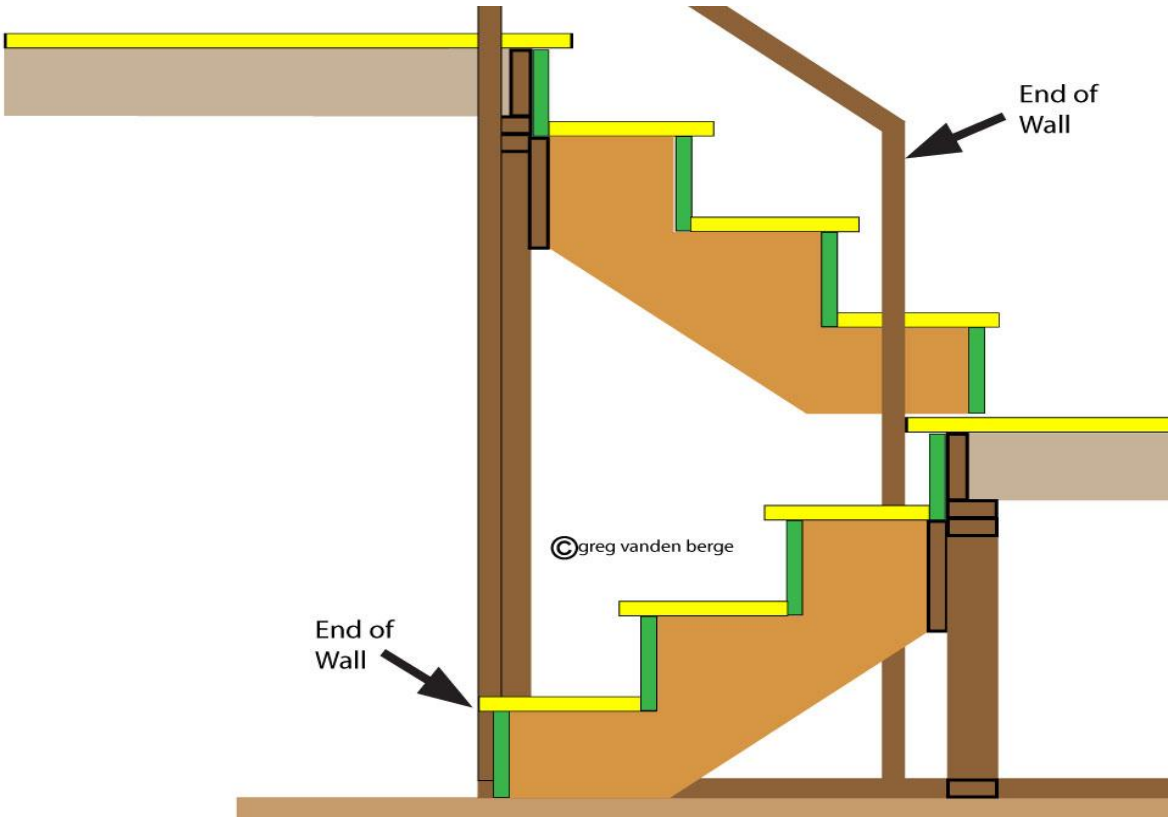
Next on the list will be the upper stairway and how its position will affect these walls and the lower stairway. Like I said earlier, if we move something on the bottom in one direction, it could affect something on the top in the other direction.



In the illustration above we have a problem. If you notice the black arrow on the right lines the landing nosing up with the nosing of the first stair tread in the upper stairway and everything looks good.

However, if we go to the other side of the stairway and plan on using the same method to attach the stringers to a ledger, then the left wall in the picture will need to be moved back. If you haven't compensated for these adjustments, before framing any walls that will be attaching to your stair stringers, then you can clearly see the problem you'll run into.

I hate to say it, but some architects, building designers and engineers don't have enough knowledge about stair building and rarely compensate for these adjustments.

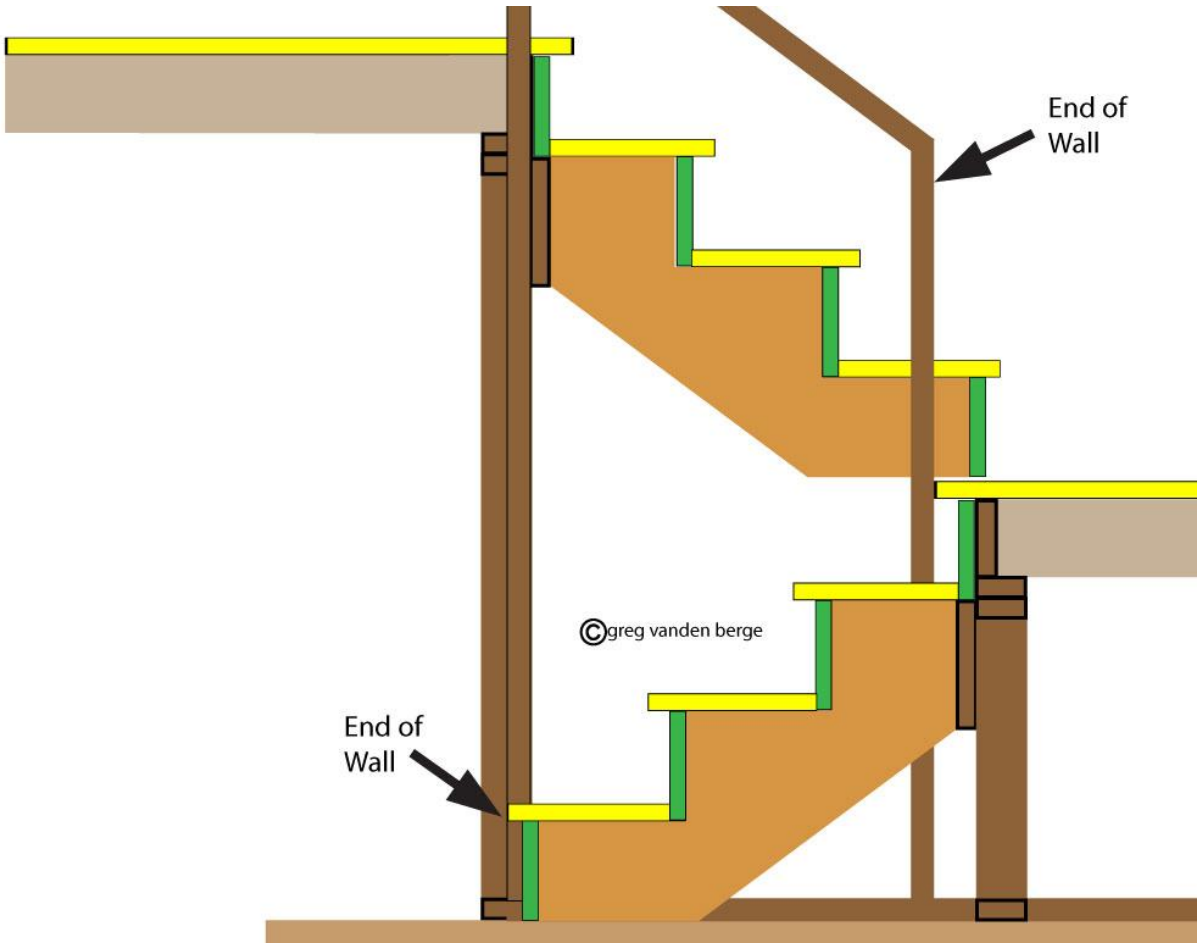


Here's what the stairway would look like if we couldn't move the wall. In the past I've been forced to build stairs like this, because we couldn't move the wall.

This is where stair building gets tricky. You obviously wouldn't be able to move this wall if it was a major structural component of the building. The wall might not be able to move because it's holding something up, a structural shear wall or moved because it would create a building code violation.

Problems like these can be solved during the design phase, but will be practically impossible to solve after the building plans have been finalized. Building the perfect stairway starts with its design.

It doesn't matter whether you're building a deck, porch or new home, if the designer, engineer and builders don't have a clue about these problems, they could turn into the builder's worst nightmare.



In the illustration above I moved the entire upper stairway two inches to the left. If you run into a situation where you have a structural wall holding something up or even a shear wall, sometimes it can be moved a little and that little bit can make all the difference in the world.

The biggest problem you're going to run into in a situation like this will usually have more to do with the landing width and whether or not it meets the minimum building requirements, for your area.

http://stairs4u.com/building%20code/stair_landing_minimum_widths.htm

For example: If the minimum width on a stair landing is 36 inches and the building designer provided you with a 40 inch landing, but the location of the upper stairway only provides you with 34 inches, then the extra 2 inches would solve this problem.

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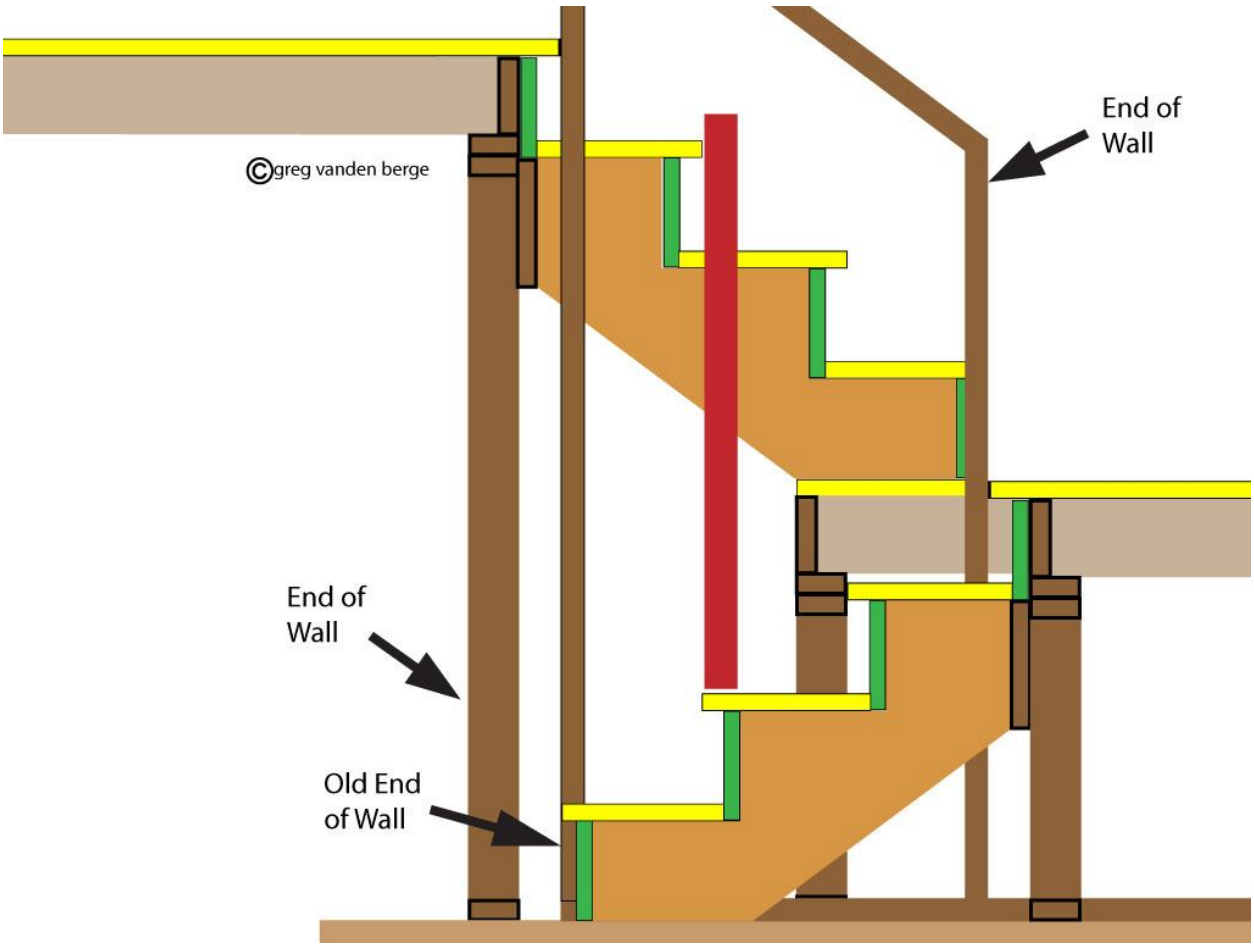
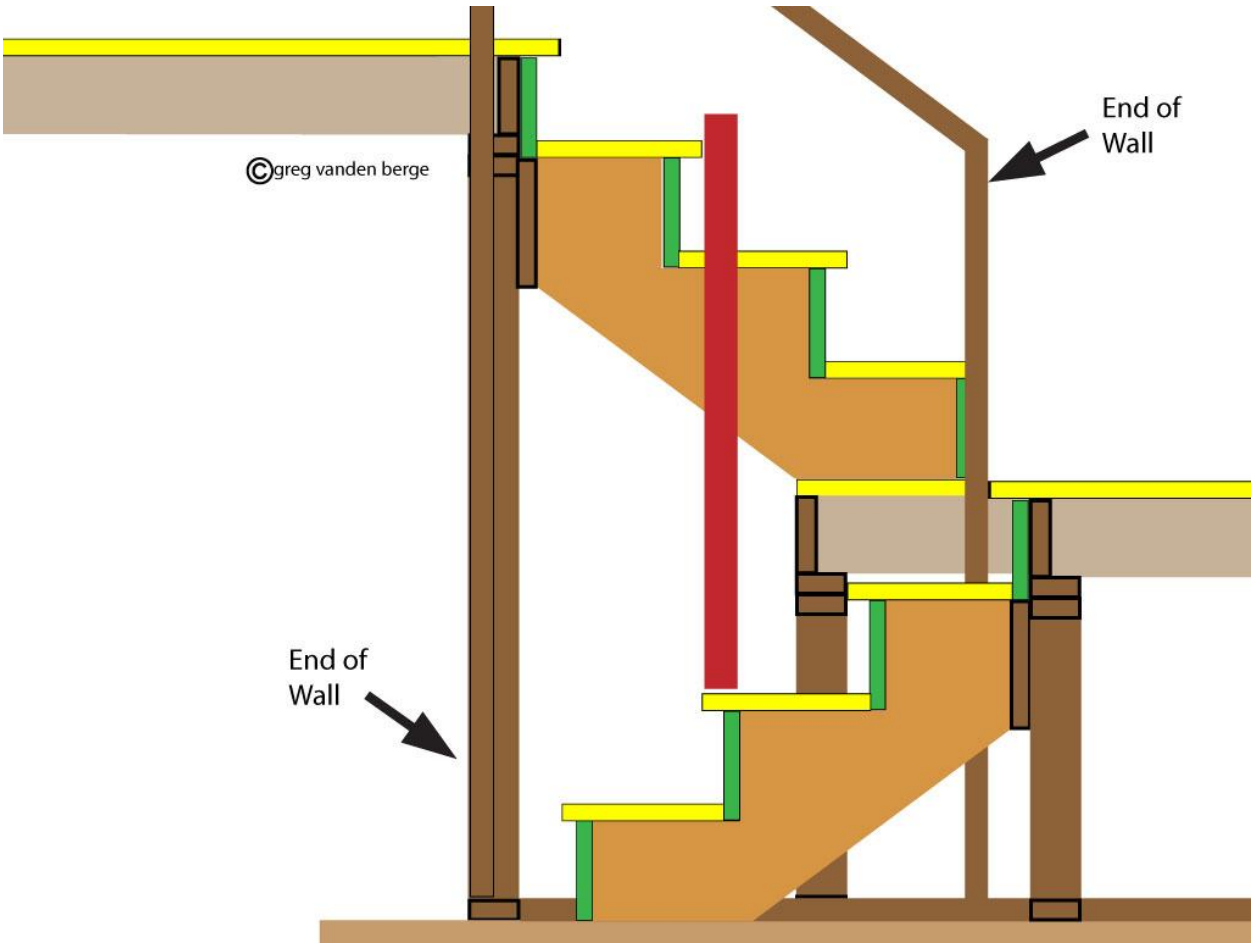


In the illustration above, I went ahead and put the landing underneath the upper stairway. The exact position of the landing isn't difficult to figure out, however it will help to have your stair stringers laid out or cut.

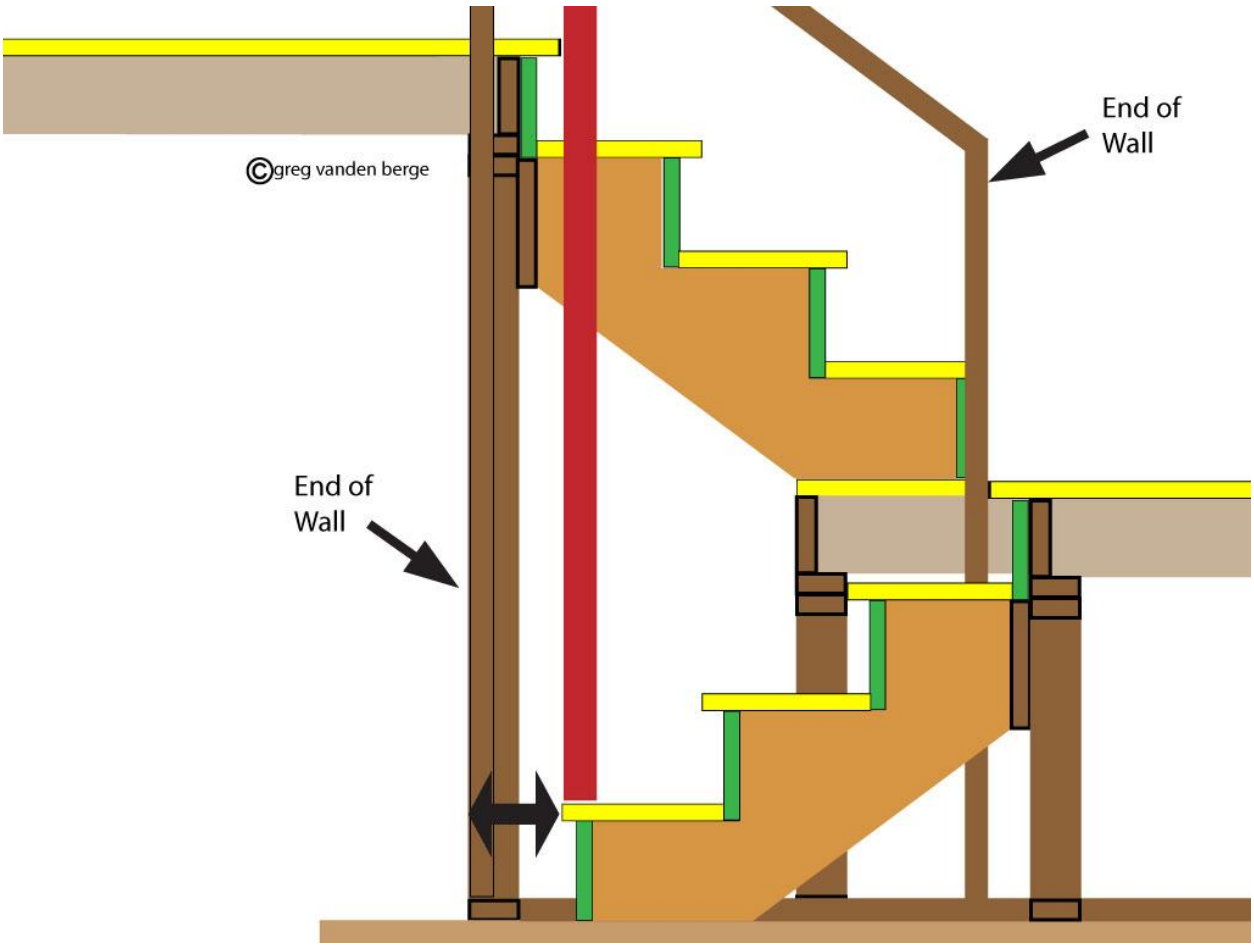
Simply measure the bottom of the stair stringer that's going to sit directly on top of the landing and make the necessary adjustments. Don't forget, the landing can always be a little longer, but it shouldn't be shorter.

For example: Let's say the bottom of the stair stringer measures 10 inches and you know you're going to have a 2 inch setback (allowing for your tread nosing and riser) and a 36 inch landing. Simply add these numbers together and add a few inches to the landing.

10 + 2 + 36 = 48 + 2 = 50



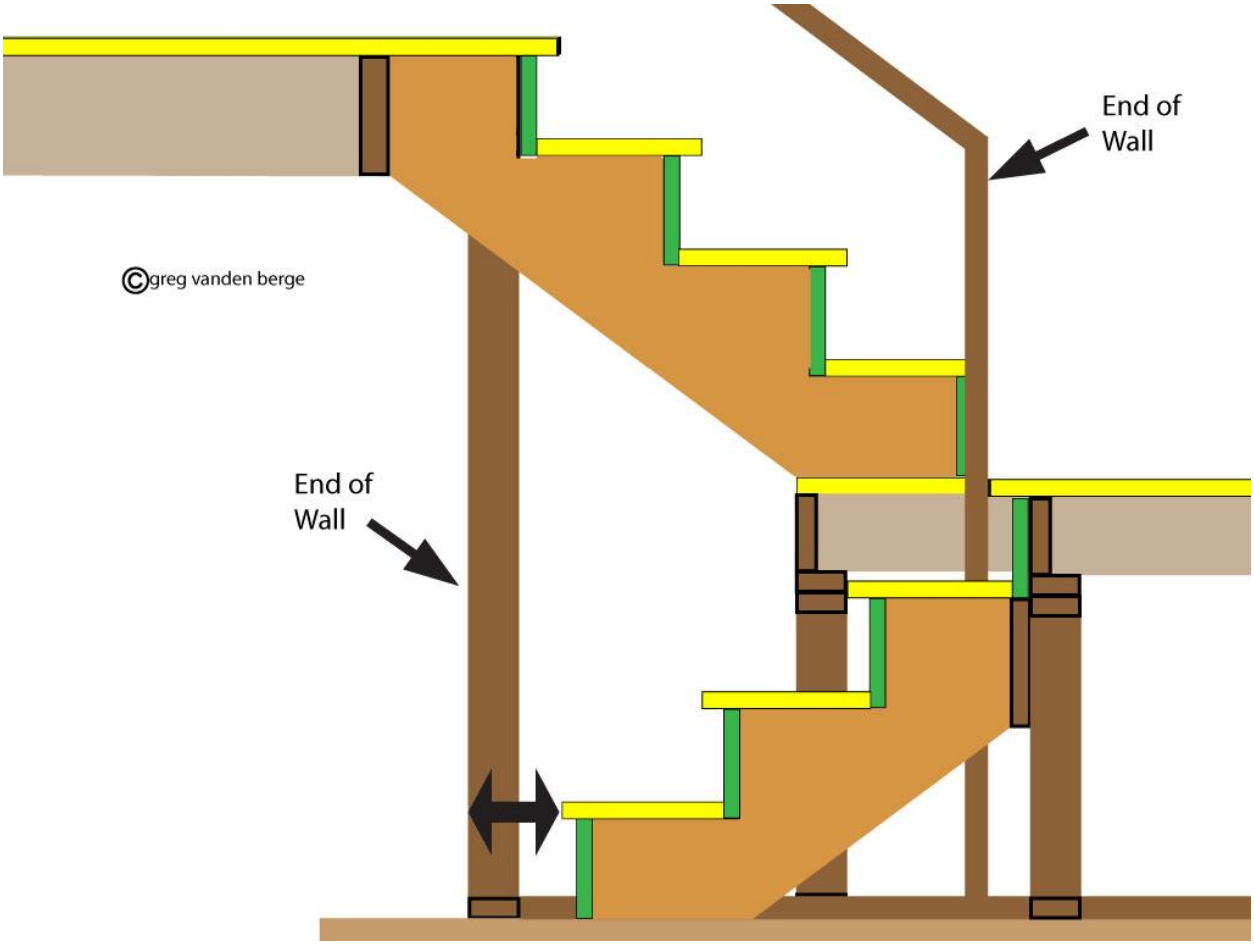
In the illustration above, I'm using a red straight edge, to give you a general idea of the position of both the upper and lower stairway. You can see they line up perfectly, but I've moved the lower end of wall back in order to compensate for the upper stairway measurements.



If you notice in the illustration above the double arrows in front of the bottom tread nosing provides us with about 5 inches of space in between the nosing and the end of wall.

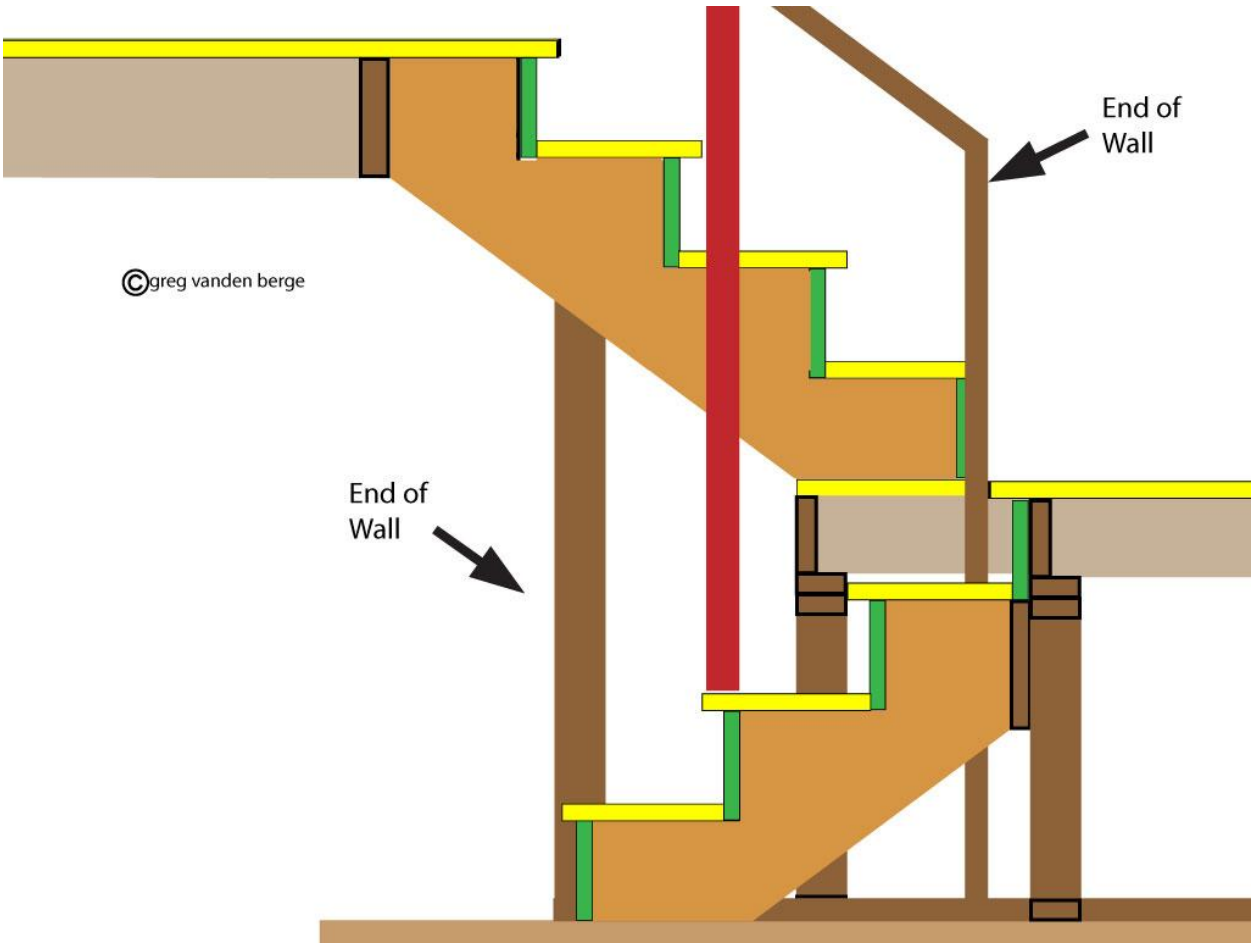
This is about the only way I can think of to build this type of stairway using ledgers. However, the only way you will be able to build this type of stairway is if you have enough room.

If the building designer provides you with 60 inches of stair run and a 36 inch wide landing, then it won't work. In order to build this type of stairway you would need to add about 5 inches to this measurement and if you can't spare the 5 inches in either direction, then the stairway will need to be built differently.

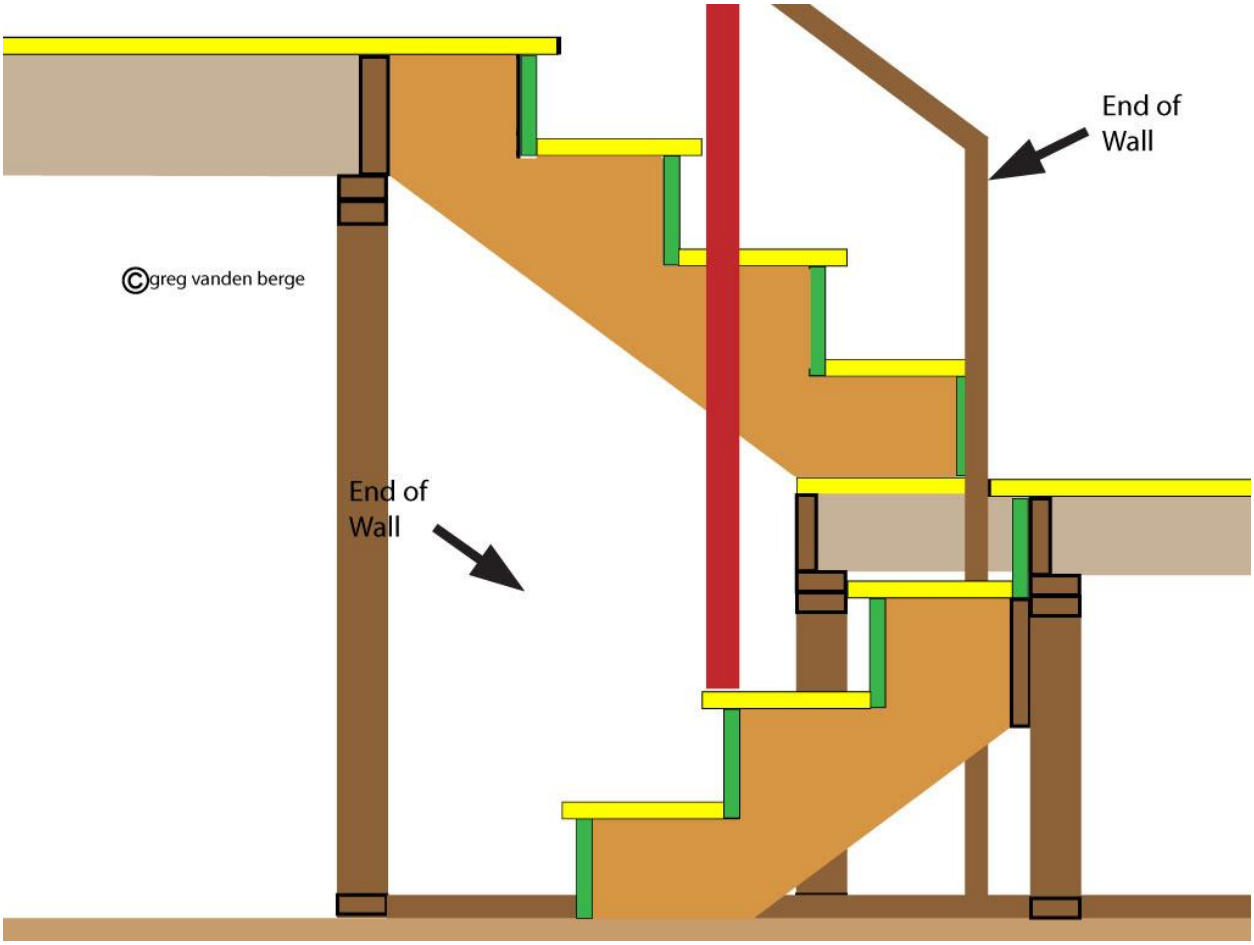


Here's another option. However, you would need to adjust the wall framing and floor joist layout, to compensate for this type of stairway. Even though this is another option, sometimes you won't be able to use it.

This type of construction could require redesigning and engineering the entire floor, wall framing and even in some cases additional foundation support.

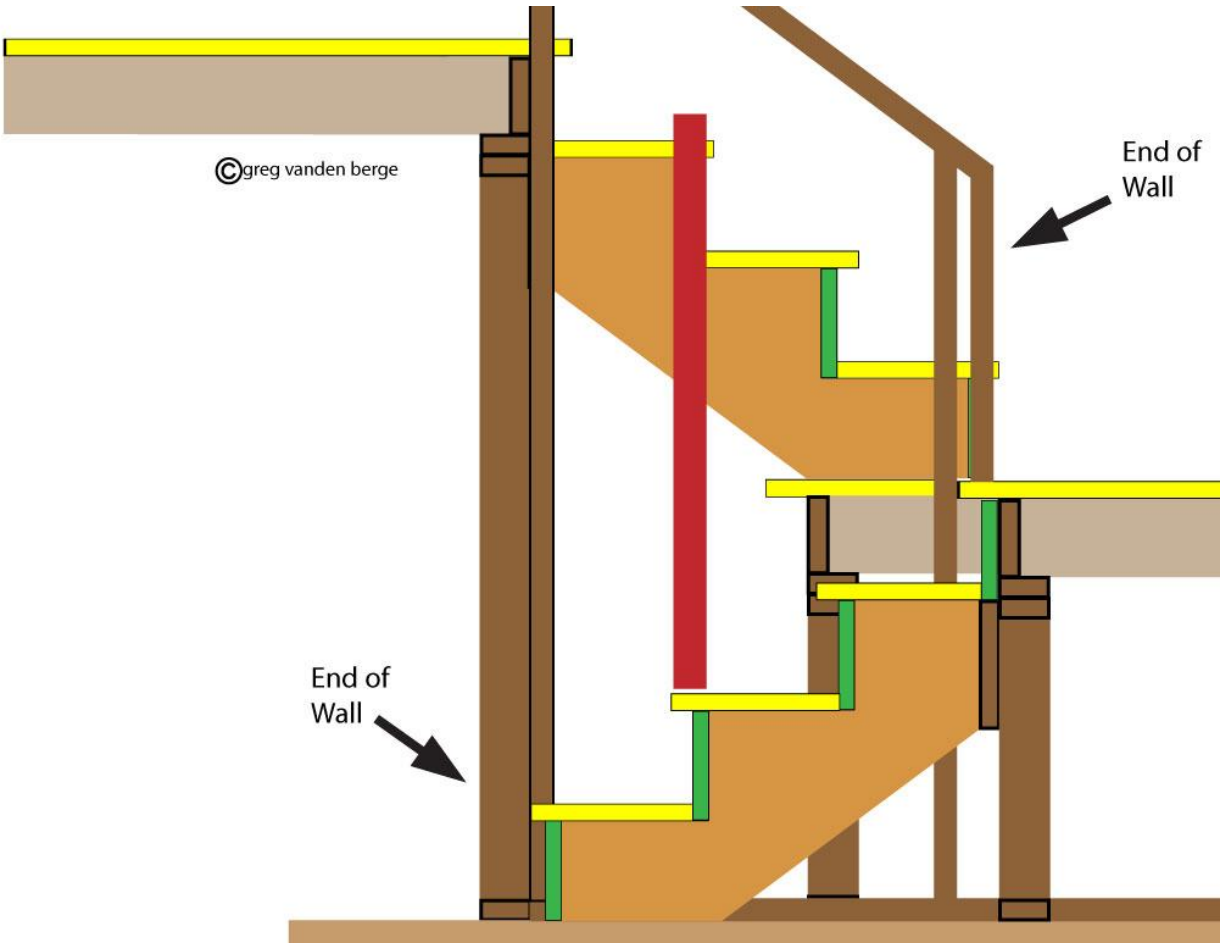


In the illustration above I moved the end of the wall back to its proper position.



Here is another method, but still wouldn't help us if we didn't have enough room. You can clearly see in the example above the distance has grown between the end of the wall and the front edge of the bottom stair nosing.

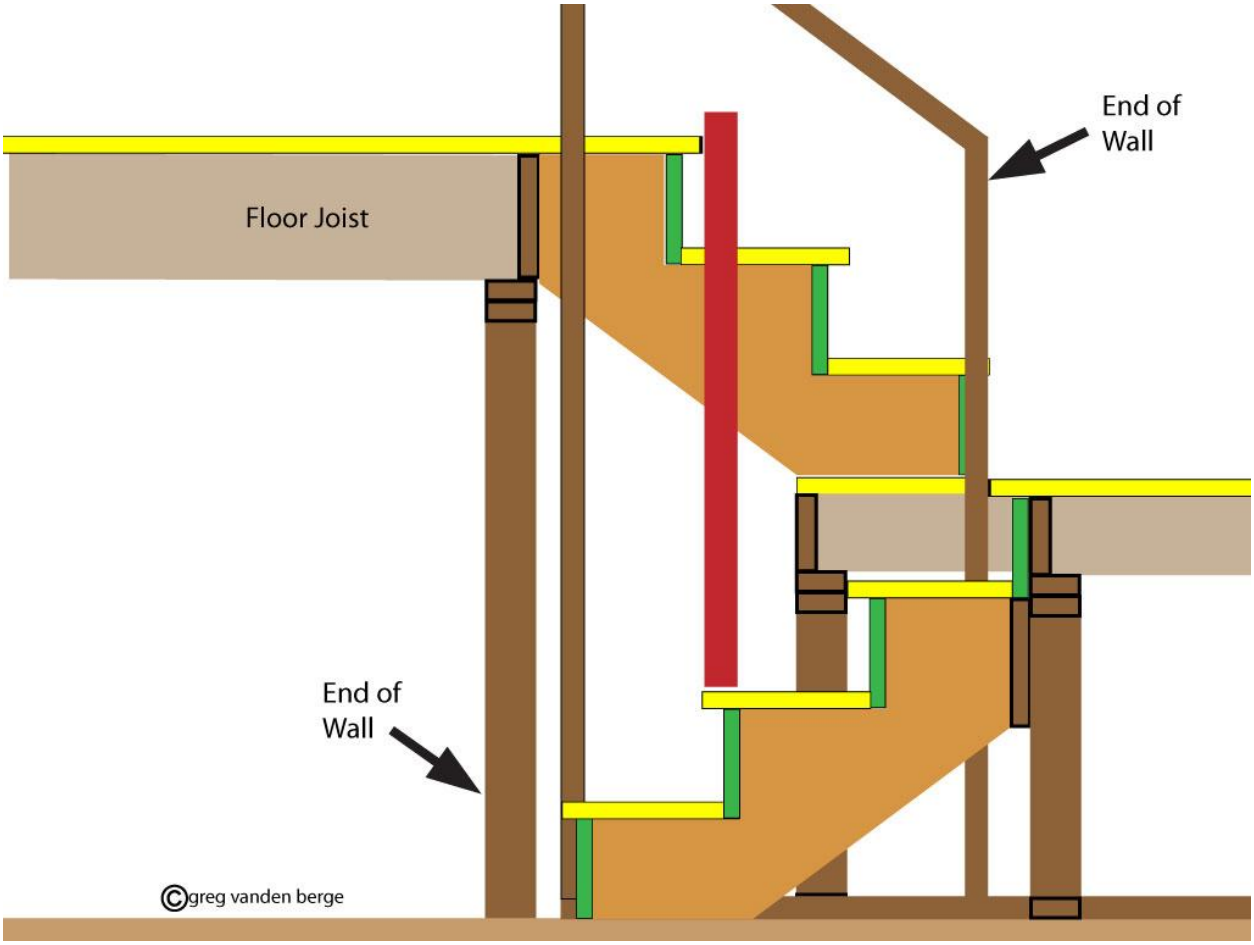
Again, this wouldn't be an option if space was limited.



In the example above I simply added a 2 x 4 to the front of the upper guard rail, to create an illusion that there isn't anything wrong with the stairway. If you're forced to use this type of stringer positioning then you will need to make adjustments to your handrails.

With this type of design and layout we've reached a happy medium. There is about a 3 1/2 inch distance between the lower end of wall and the lower stair tread nosing.

At the same time the upper stairway isn't protruding into the landing area as much as it could have. Sometimes we will need to make sacrifices in one area to compensate for another and this provides us with an excellent example about what I'm talking about.

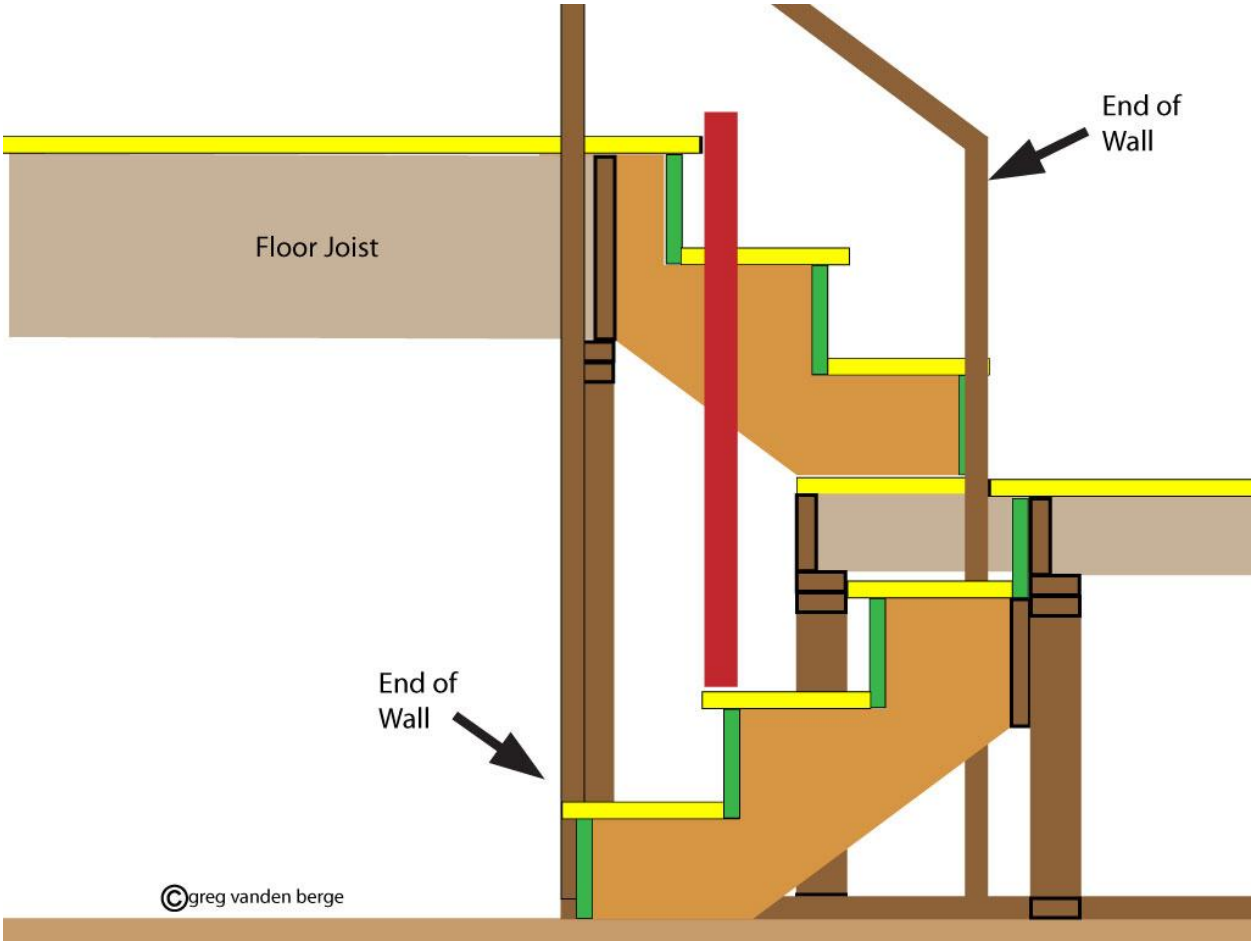


In this example I increased the width of the floor joist and positioned the end of the lower wall directly underneath the headout. If you're having a problem with the stairway design, but you're still in the design phase, you could make changes like this.

Now let's see if you were paying attention. I also changed something else, but do you know what it is. I went ahead and I removed one step from the upper stairway.

The illustration above provide you with an excellent example of how we can change the stair design and structural framing, simply by removing or adding a step from the upper or lower stairway. Again, these are changes that would need to be made in the planning stage, not during construction if possible.

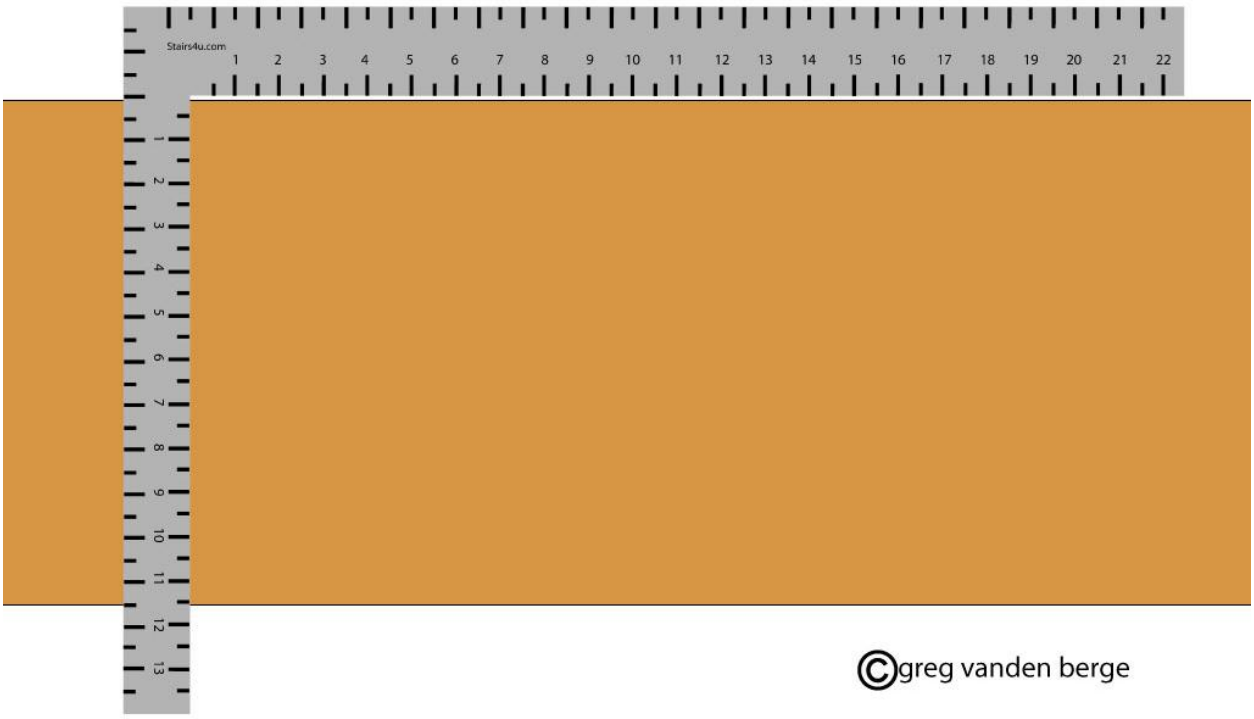
If you can remove one step from one part of the stairway, you can always add it to another section or put a step in the landing.

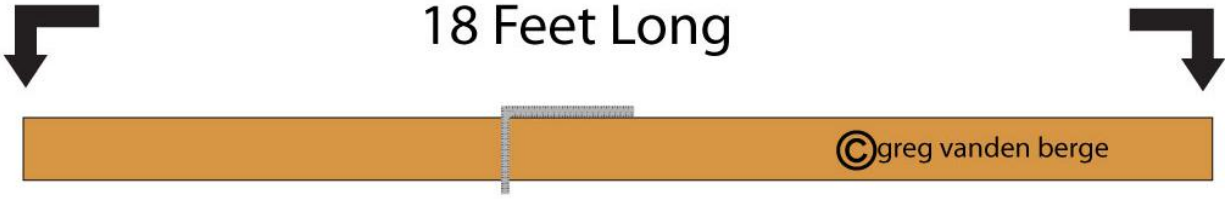


In the diagram above I increased the floor joist height, allowing the stairway headout connection to move even further towards the right. There are a few simple adjustments you can make, while laying out and designing the stairway, if you know what to look for and this book will help.

By now you should have a pretty good idea how to build a set of stairs with one, two or even multiple landings. With these skills firmly etched in your mind, it's time to go on to the next step and figure out exactly how we want to layout our stair stringers.

Long Stringer Layout



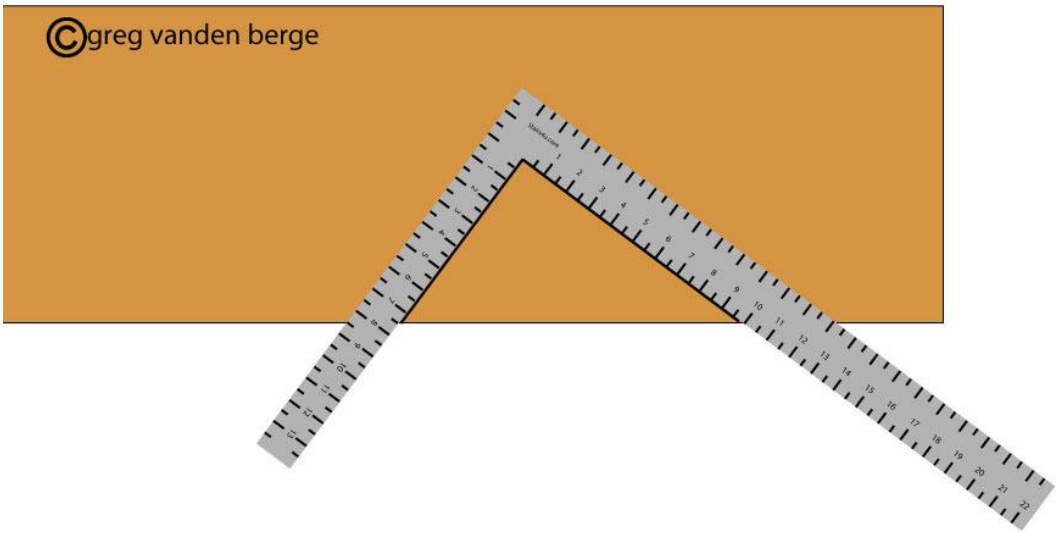


In the long stringer layout example we're going to use an 18 foot 2 x 12.

When laying out stringers for stairs with landings, I like to use longer boards.

This way you can see the entire stairway and even reduce mistakes. However, if you prefer to layout your stringers on two separate boards, just double check and re-double check and if you feel the need to double check a third time, then do so.

Successful stair stringer layout and stairway construction relies on precise measurements. Remember the old adage," Measure twice, but cut once," well this also applies to stair stringer layout and you better not forget it.



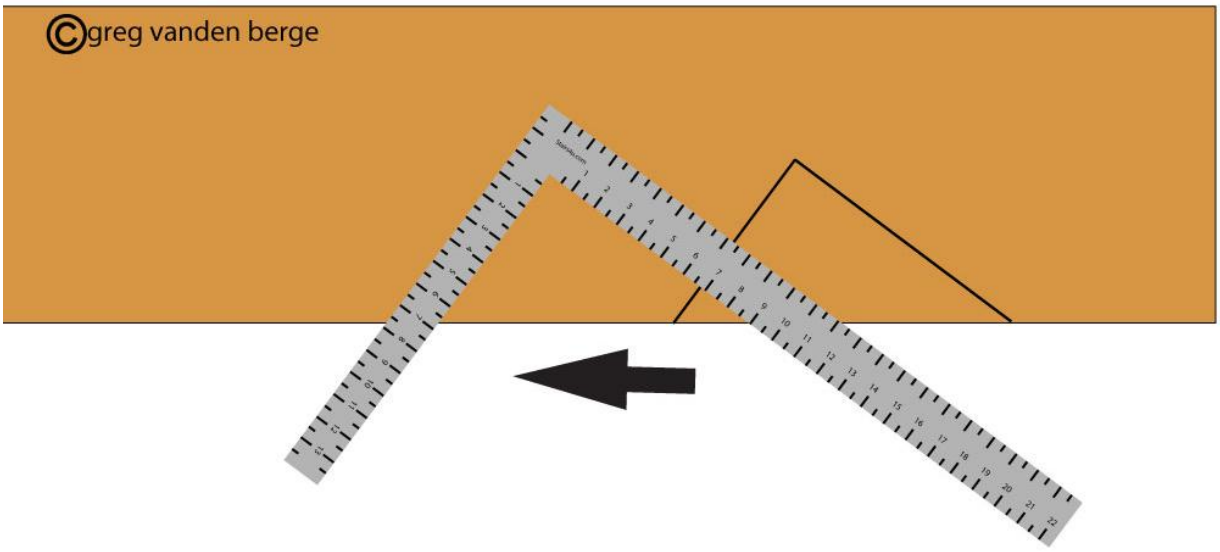
Step 1: We're going to start on the right side and work our way to the left. Position your framing square between 6 and 12 inches away from the right side of the board you've selected to layout your stringer.

Line the riser and tread measurement marks on the framing square up with the front edge of your board and mark.

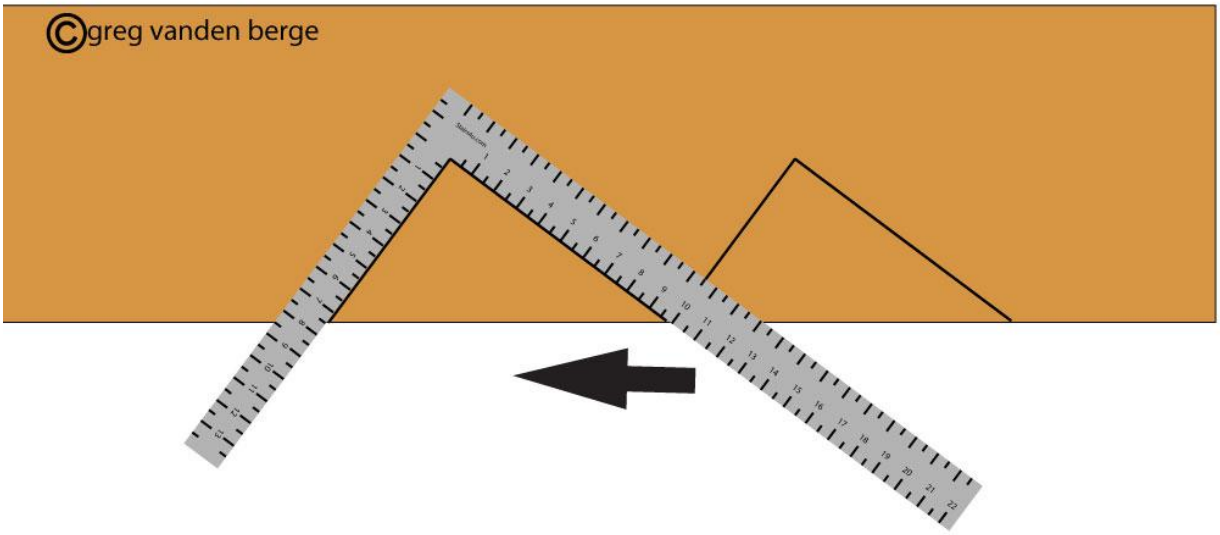
In our example we will be using a 10 inch tread and a 7 1/2 inch riser. If you have different sized treads and risers then you will need to make the necessary adjustments.

http://www.pic.stairs4u.com/splitlevel/laying_out_stinger.htm

http://www.pic.stairs4u.com/split_level_stair_framing.htm



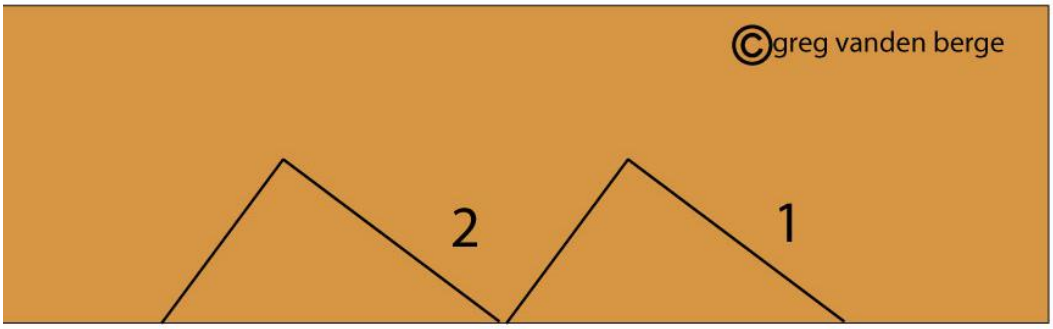
Step 2: After you've marked your first tread and riser slide the framing square to the left and reposition.



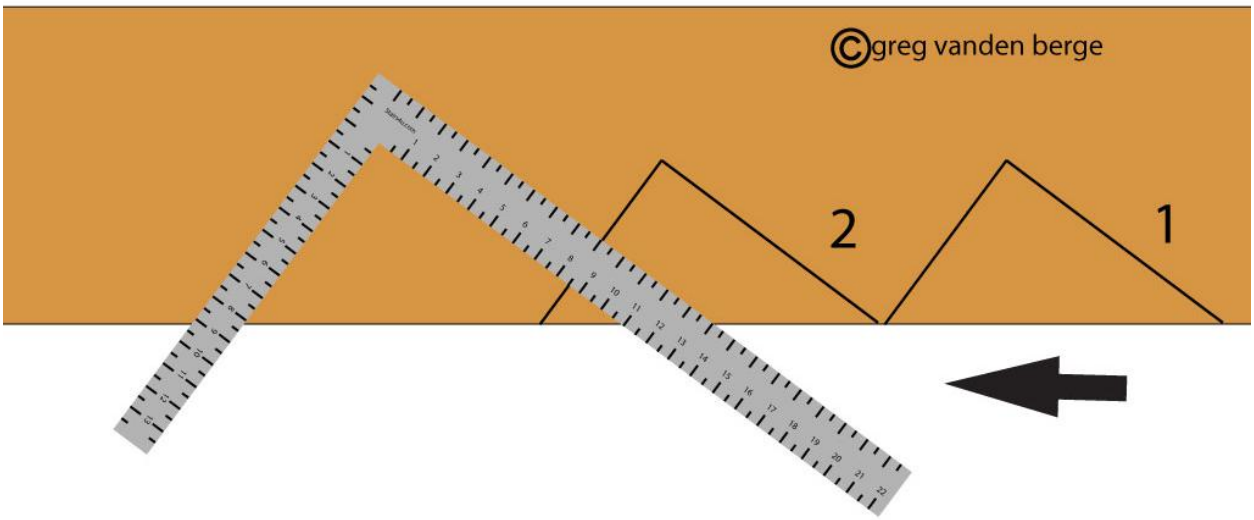
Step 3: In the illustration above, the 10 inch tread measurement on the framing square will need to line up with the edge of the lumber and the previous mark you made for the riser.

After you've reposition the framing square and the tread and riser measurements on the framing square line up with the edge of the lumber, then feel free to mark the second step.

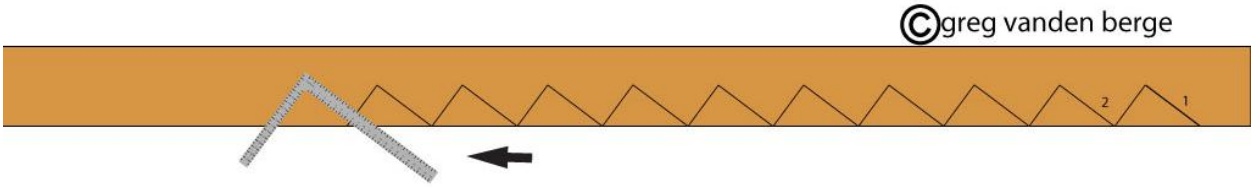
http://www.pic.stairs4u.com/splitlevel/stair_gauge_tread.htm

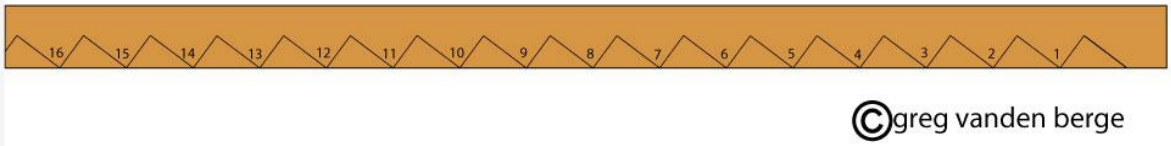


Step 4: You should end up with something looking like this and it wouldn't be a bad idea to mark each step as shown in the illustration above. Make sure you double check each number to verify whether or not you've skipped one or duplicated one along the way.



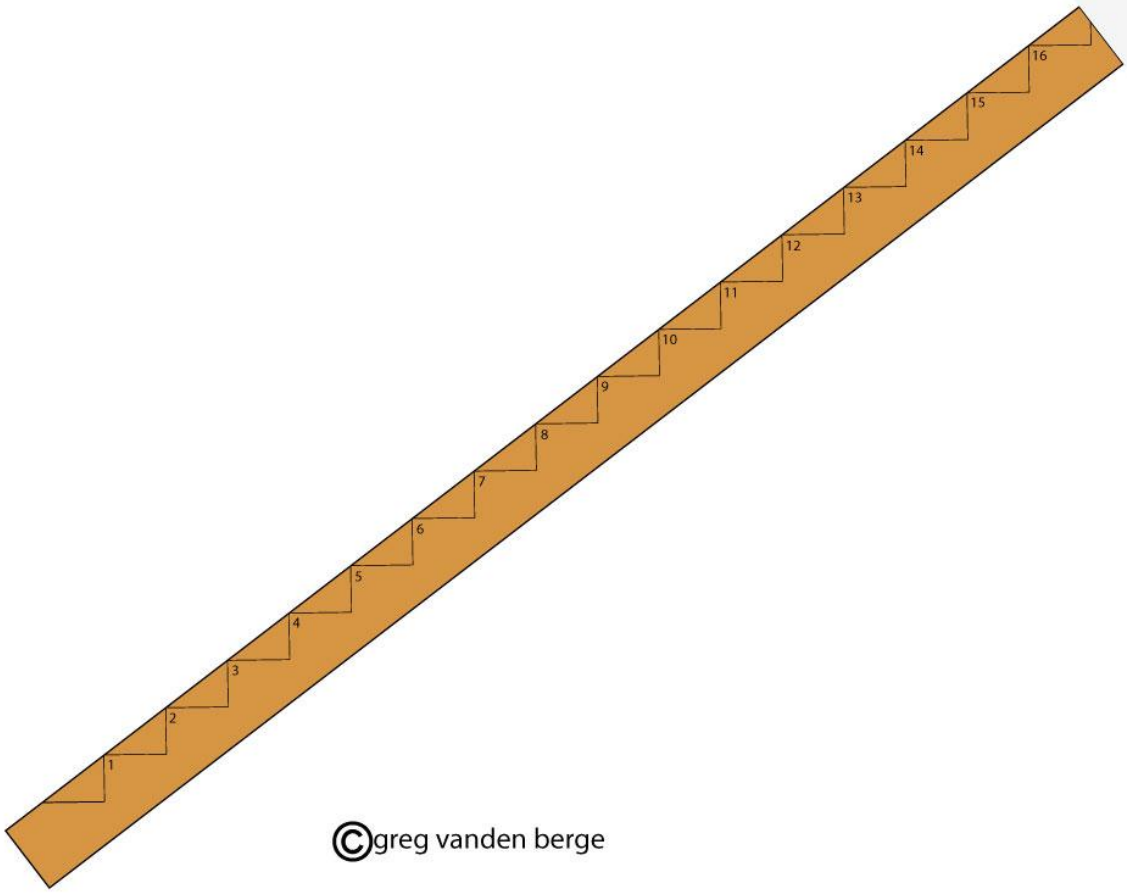
Step 5: Simply slide the framing square to the next step and repeat step number 3. After you position the framing square and marked the third step, continue working your way down the rest of the stringer, until there's no more room to mark another step.

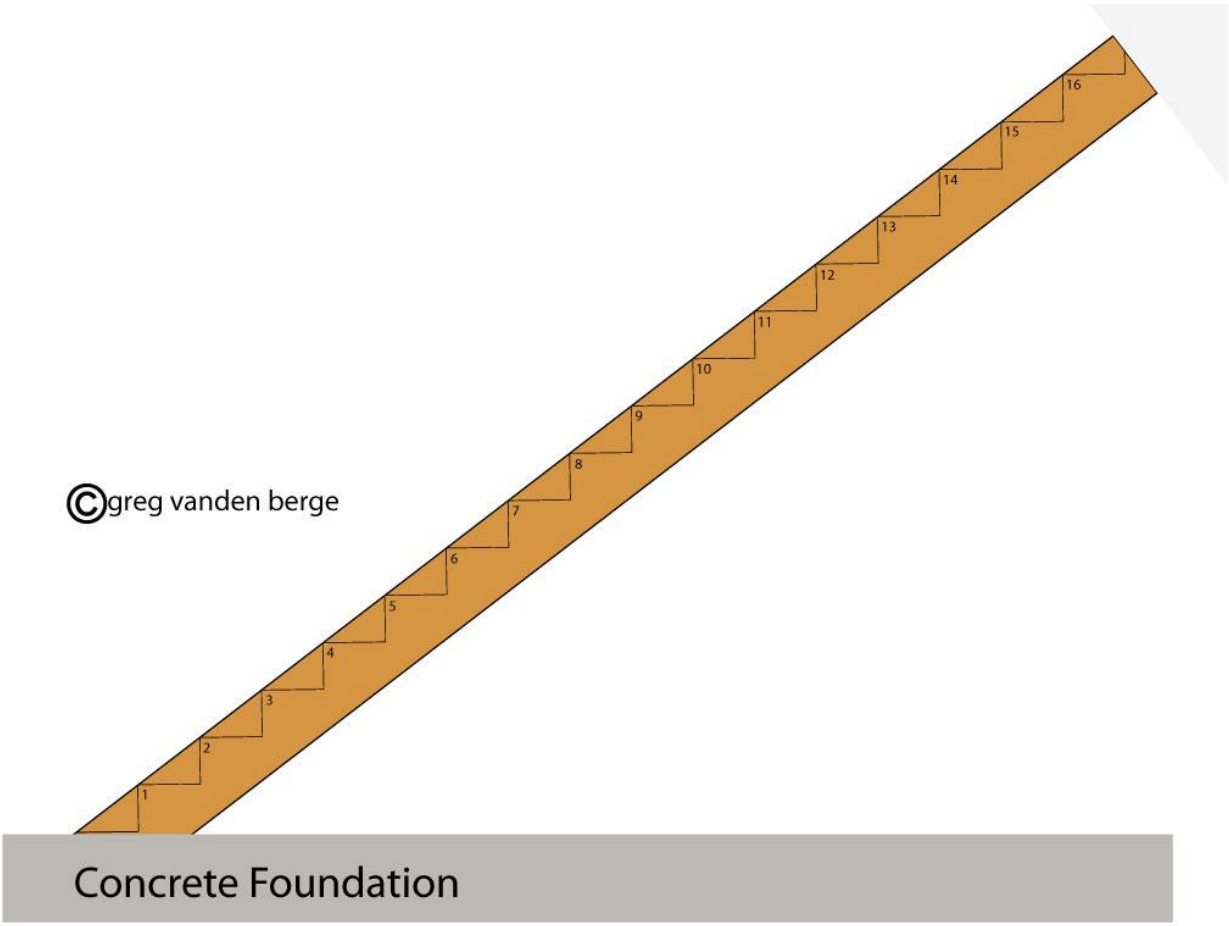




Step 6: By the time you're done you should end up with something like this and will be ready to layout the tops and bottoms.

http://www.pic.stairs4u.com/splitlevel/upper_stair_stinger_layout.htm





In this illustration I rotated the stair stringer, to give you a better idea of what's going on. The steps haven't been cut out yet, but you can clearly see the set of stairs and each individual numbered step.

For more stringer layout ideas, check out the next section and bonus book.

Simple Stair Stringer Layout

By Greg Vanden Berge

Published by Greg Vanden Berge

Greg's Books

Home Buyers Checklist
How To Build Straight Stairs
501 Contractor Tips
Simplified Stair Building
Guide For Hiring Contractors
Simplified Bracket Stair Building
Simplified Tile Floor Installation
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Stair Stringer Lumber Selection

Note from Author: Feel free to skip this chapter if you're already familiar with the type of lumber you need for your stair stringers.

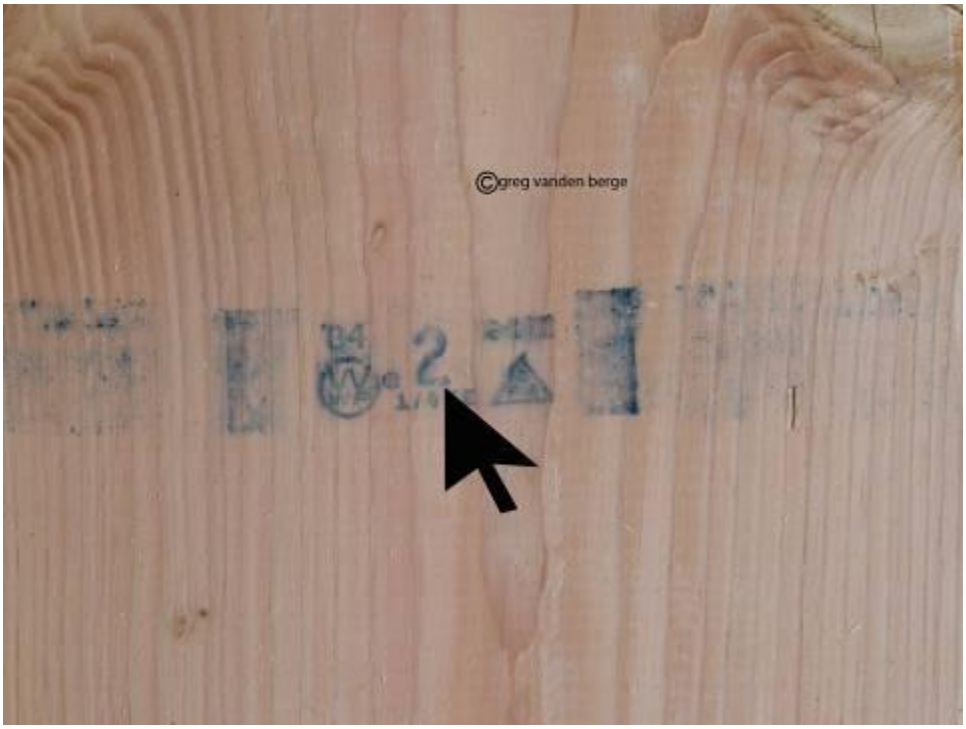
The lumber you're going to use for your stair stringers is commonly referred to as construction standard lumber. On the east coast it might be Southern Pine and the West Coast of the United States it could be Douglas Fir.

Construction standard lumber usually comes in a few different grades and these grades should be stamped on every piece of lumber. The preferred lumber for your stairway will be number two and better.

It might be difficult to see in the picture above, but this piece of 2 x 12 is stamped with the number one. The only grade better

than this is commonly referred to as select and you might end up paying a little more money for it, however it won't be necessary.

A nice piece of grade number one or two should be sufficient for most projects.

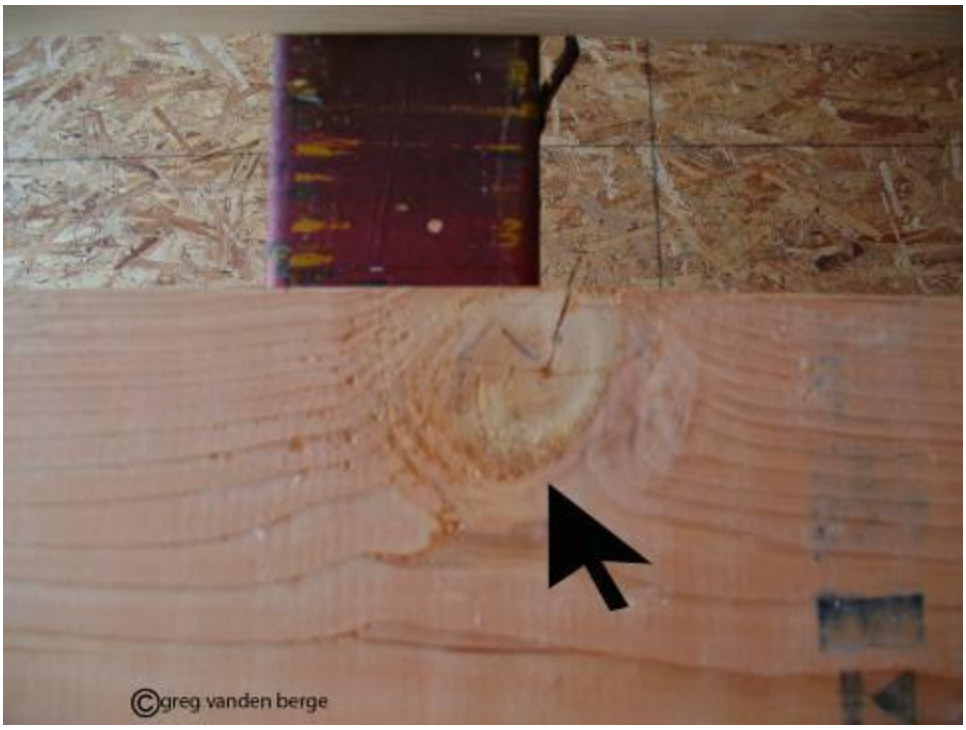


The picture above provides you with an example of a number two grade stamp.

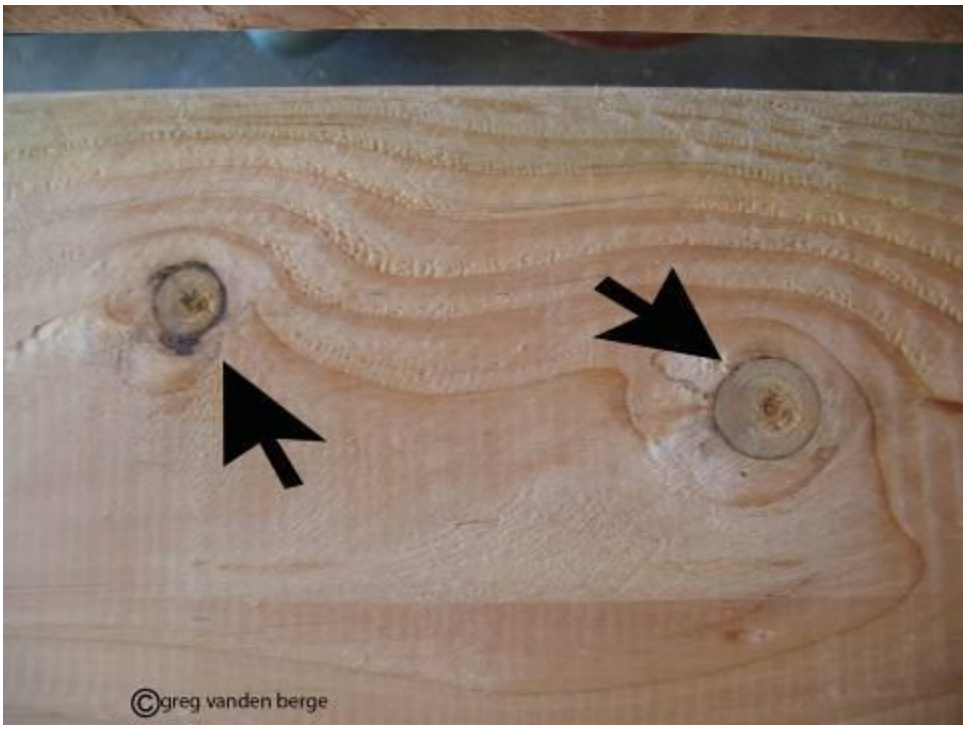
Here's a 2 x 4 with a large knot near the center. Knots like these aren't a stair builder's best friend and should be avoided whenever possible. There's a good chance this 2 x 4 will bow or twist in the future unless it's already dry.

Most construction grade lumber will be moist and could do all sorts of different things before they finally dry.

I don't recommend using lumber for structural supports or stair stringers with knots larger than one third of the boards width.



Here's a knot with a few cracks in it and I would imagine over time could weaken a stair stringer, if located in the wrong spot. In other words, it's okay to use 2 x 12 or 2 x 14 with larger knots as long as they can be positioned correctly or cut out and removed entirely.



Smaller knots like these located near the center of the stair stringer shouldn't be a problem. Knots that "could" create problems for your stairway in the future are usually going to be located near the bottom edge of the finished stringer.

There's a good chance you won't find a board at your local lumber yard or home improvement center without any knots. All I'm asking you to do is simply pick through a few boards and select the best ones for your project.

You're going to be looking for the straightest boards, with the fewest knots.

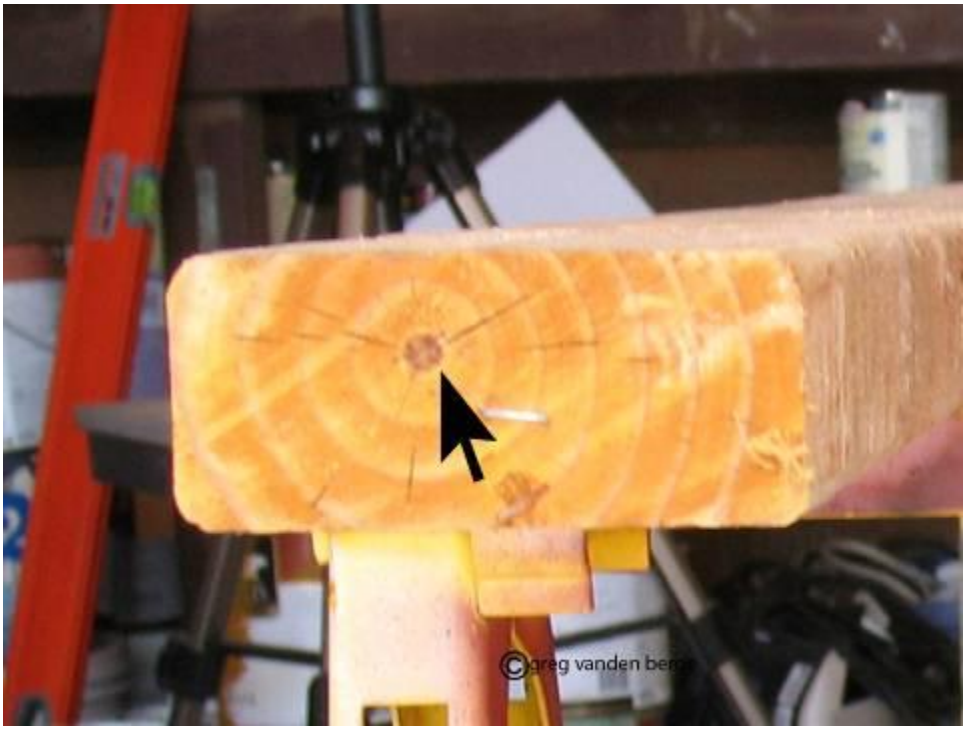
As a general rule of thumb, most of the lumber marked as number one and select should be, but won't always be the best choice or the highest grades. There have been plenty of times, I've found a nice piece of number two grade lumber that should have been marked as select and select grade lumber that should've been marked as number two.

It's hard to tell in this picture, but I've selected a straight 2 x 12 with a limited amount of knots, from my local home improvement center. When selecting a straight piece of lumber, simply pick the lumber up at one side and look down the edge or length of the lumber, to see if it's straight.

However this won't provide you with any guarantees. The lumber I selected for this project looked great when I selected it. However, two weeks later I realized one of the boards had bowed and was no longer as straight as the day I selected it.

This shouldn't be a problem unless the board looks like it's going to create problems for your stairway, but I'm going to leave this decision in your hands.

I don't recommend using 2 x 10, but do recommend using 2 x 12 or 2 x 14 for your stair stringers. Remember, this is only a recommendation and will depend upon the type of stairway being built.



Another thing you should try and avoid would be selecting lumber that was cut from the center of the tree. The black arrow in the picture above is pointing to the center of the tree and there's a good chance this 2 x 4 will twist, bow or warp in a variety of different directions.

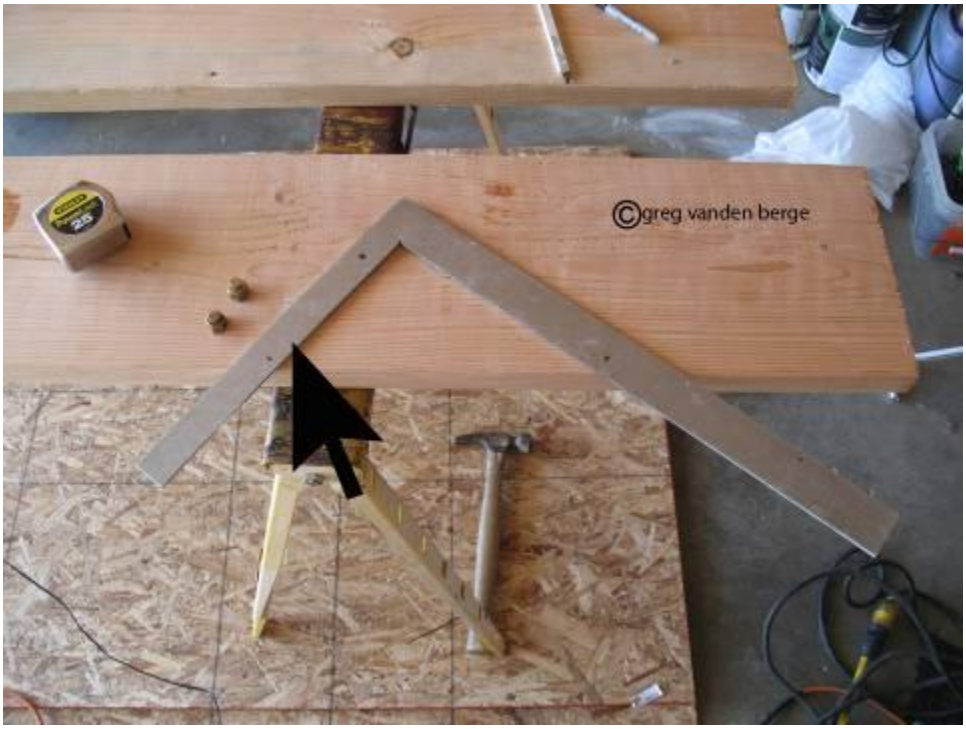
You should avoid using center cut lumber whenever possible, for your stair stringers.

Last but not least, make sure the lumber you select for your stair stringers doesn't have large cracks running through the board. Cracks like those shown in the picture above shouldn't be a problem, when located near the end of the board.

The reason for this is simple, because they can be cut out and never seen again. If you find a nice straight board with a few knots, but it has a large crack about 12 inches from the end and you know for a fact you can cut it out, then it wouldn't be a bad idea to purchase that particular board.

Most of the time you can start your stair stringer layout a few inches away from any cracks or imperfections and avoid them completely. This would also include large knots. If you have an extremely large knot located at the end of a straight piece of wood and you know it won't be a problem. Then you've just found another board to use for your stair stringers.

Stair Stringer Layout Tools

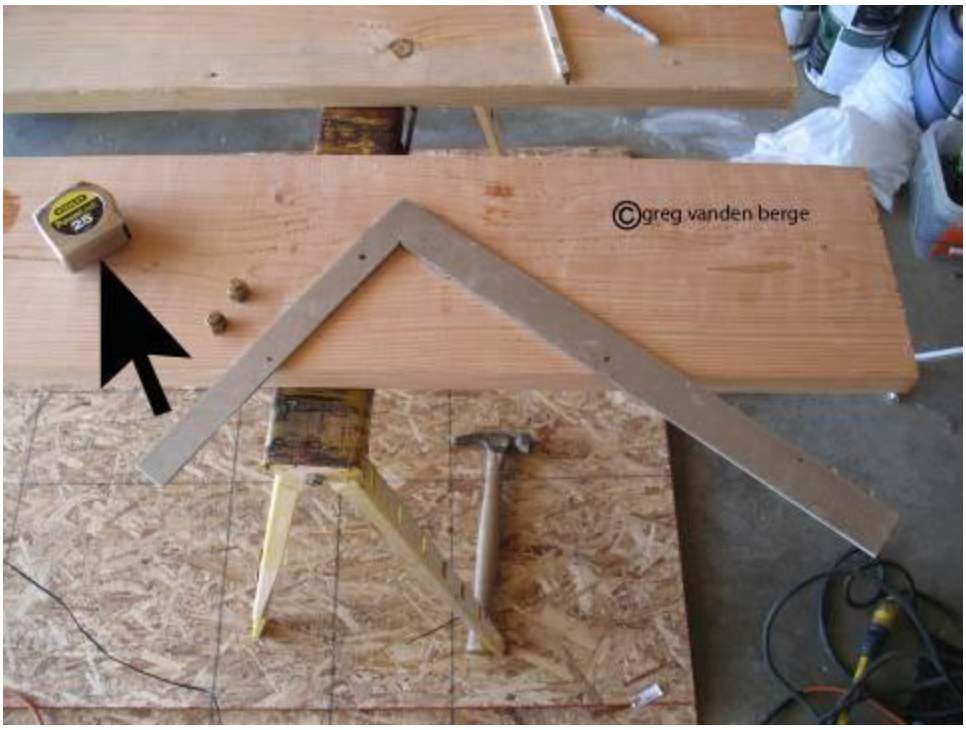


The Framing Square

This is the most important tool for laying out your stair stringer. If you don't have one then head down to your local lumber yard or home improvement center and pick one up.

If you're going to purchase one, then it wouldn't be a bad idea to grab five or six framing squares and stack each one on top of the other, while lining them up. All of the squares should be exactly the same, if not then find another manufacturer that does.

I don't always recommend buying the cheapest framing square, because they aren't always perfectly square and this could create problems for your stairway. I've also seen framing squares with incorrect measurements, so be warned.

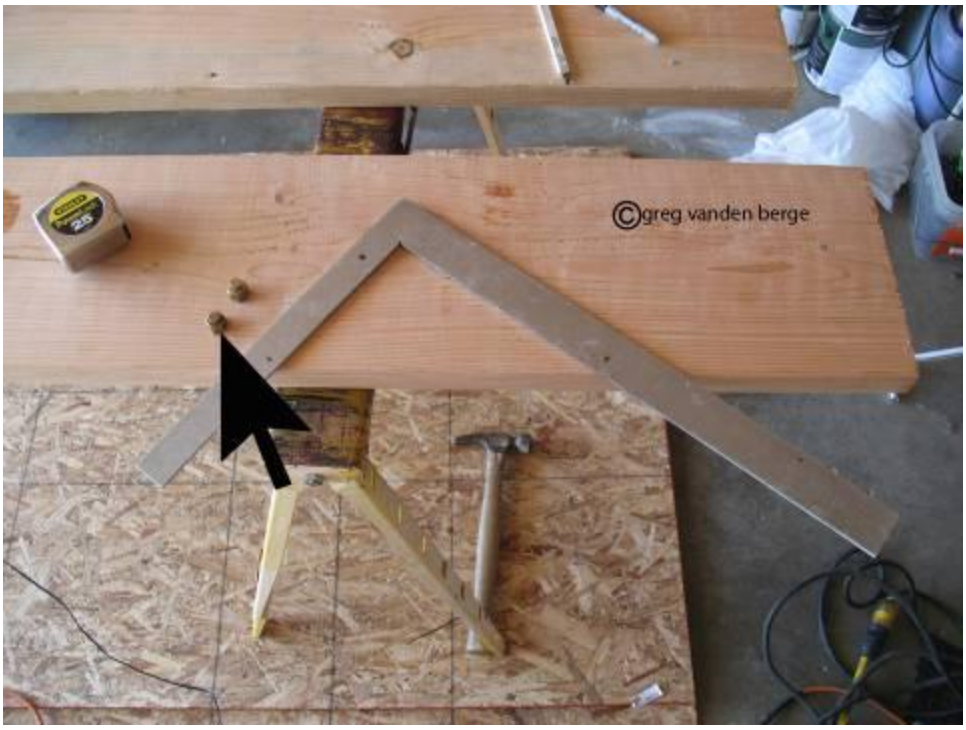


Tape Measure

Like the framing square, it would be difficult to layout a stair stringer with out one. Even though it would be possible, your tape measure will provide you with additional insurance.

A tape measure provides you with a way to double check all of your measurements and when laying out a stair stringer, this could make all the difference in the world. Your measurements need to be exact or at the least as close as they possibly can, to being right on the money.

They key to laying out the perfect stair stringer will be perfect measurements.



Stair Gauges

Stair gauges provide you with one of the best ways humanly possible to eliminate your chances of stair stringer layout failure. Let's face it, people make mistakes and stair gauges provide you with another way to eliminate the possibility of making them.

If you don't position your framing square correctly, each time you slide it up or down the lumber you could be in trouble. For example, if you're off an eighth of an inch on each step, while laying out an eight step stairway, then you've just created a one-inch problem for your stairway.

This same problem could occur if your stair gauges aren't positioned properly on the framing square.

Attaching Stair Gauges Correctly

For our sample stair stringer we will be using a 7 1/2 inch rise and a 10 inch tread (step).

Note From Author: In this book we're only going to provide you with stair stringer layout information. If you need more information on stair building or don't know how to figure out your individual riser or tread measurements then you should pick up the book," Simplified Stair Building."

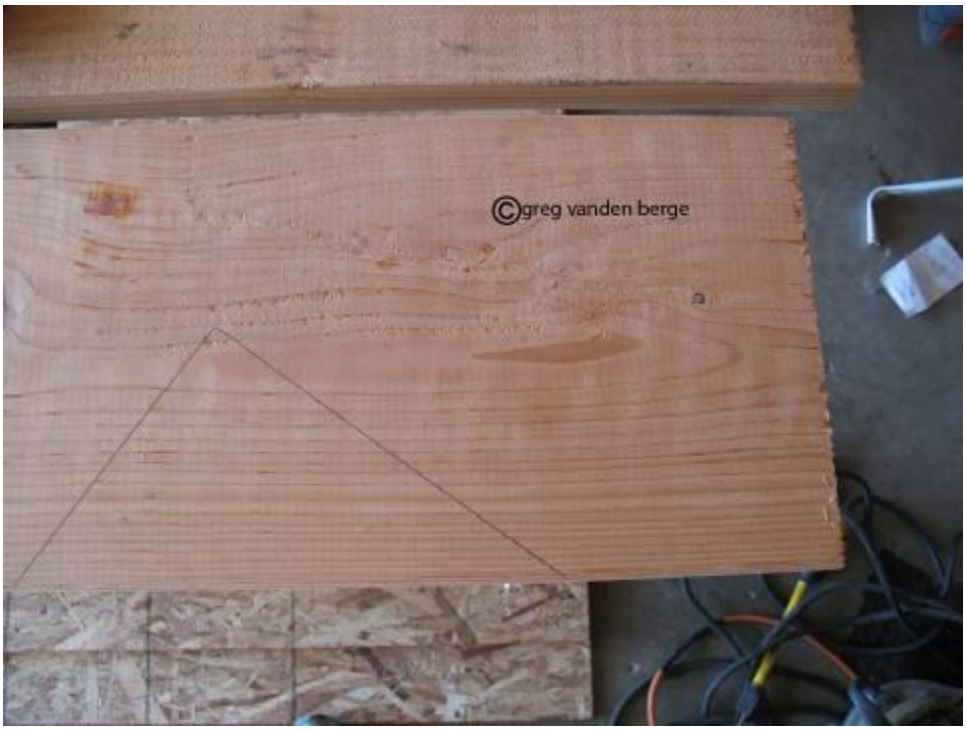
This book can be found at:

http://stairs4u.com/stairbuildingbooks.htm

If you look at the picture closely, you'll see that I marked the exact location for our 10 inch tread and 7 1/2 inch riser with a permanent marking pen. Also, in our example we will be using the inside of the framing square instead of the outside.

Simply do the best you can to line up the stair tread and riser measurement marks on your framing square with the edge of the lumber you're using for your stair stringer. After you've lined it up, grab a pencil and mark the inside of the framing square.

This will provide you with your first step and riser.

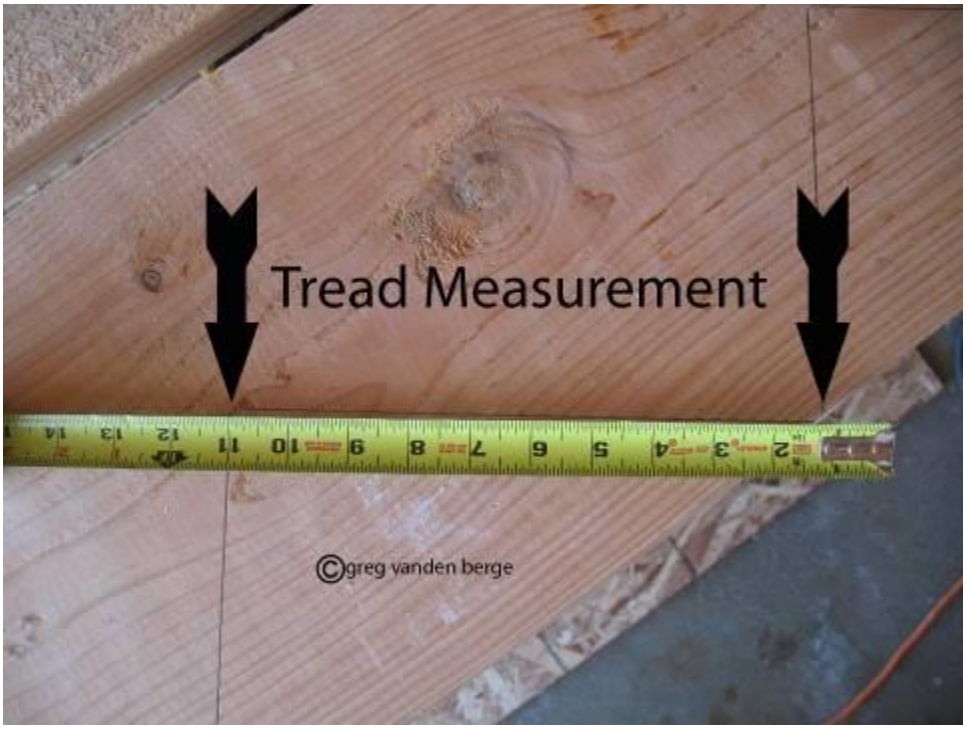


You should have something like this after removing the framing square.

Next on the list will be to slide the framing square down the board until the stair tread measurement mark on the framing square lines up with the last riser you marked.

Do not layout any more steps until you finish the next section on how to double check your measurements.

After you've laid out the first two steps grab your tape measure, because it's time to double check these measurements. This is one way to check your stair treads and risers, but it isn't always going to be the best.



However, this is. Simply line the 1 inch mark on your tape measure up with the riser or tread on one side to verify whether or not you have the correct measurement.

Note From Author: Even though this provides you with precise measurements, it can be confusing. The inch you subtract on one side of the tape measure will also need to be subtracted on the other side. There's been plenty of times when I needed a 7 1/2 inch riser, but ended up with an 8 1/2 inch one, because I wasn't paying attention.

The reason why I don't want you using the front of your tape measure is because it often gets loose or might not have been set correctly at the factory. However, if your tape measure works fine and is perfectly calibrated then feel free to start with the front of your tape measure.

My father showed me this trick and realistically, it will make all the difference in the world. Your stairway treads and risers need to be as close to perfect as humanly possible, to prevent installation problems and safety hazards.

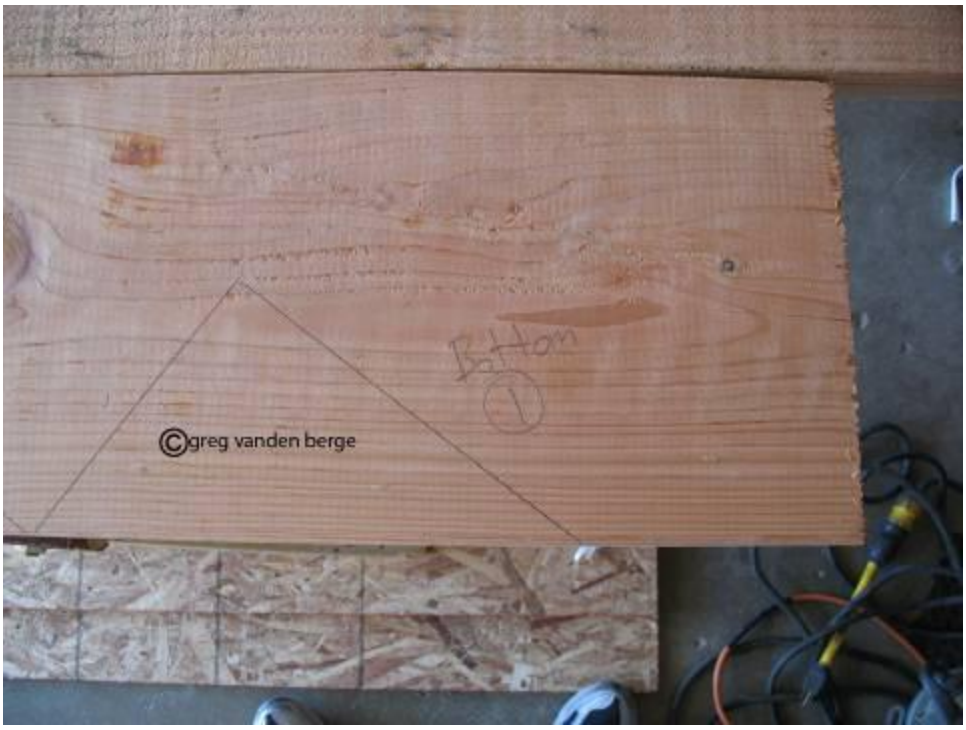
Longer stairways will be affected more than shorter ones, if any of these measurements are off even the slightest amount.

If your measurements are off a little bit, simply readjust your stair gauges, draw two more steps and recheck your measurements. Feel free to draw as many lines as you need to on one side of the lumber, until you have your framing squares set up correctly or as close to perfect as humanly possible.

Then simply turn the board over and finish laying your stair stringer out.

The stair stringer in our example is only going to have three steps and will look like this when completed. If your stairway needs 5, 10 or 15 steps, simply continue sliding your framing square down the board, marking each one as you go until you reach the desired amount.

If you have the room, I recommend laying out a few extra steps. I can't tell you how many times I removed the stair gauges from my framing square, before realizing I needed to layout one more step.



Then it wouldn't be a bad idea to number each one of your steps. Start with number one at the bottom and work your way up. It also wouldn't be a bad idea to write the word bottom on the first stair step and the word top on the last one.

It also wouldn't be a bad idea to verify, whether or not you marked each step, with the correct number. If you end up skipping a number or duplicating one, then you'll have a problem.

Like I said, double check everything you do and re-measure as often as you feel necessary.

The picture above has the word top next to the number three providing us with a crystal-clear representation of the last step.

If you're going to paint the stair stringers then you should mark everything lightly with a pencil and avoid using permanent marking pens.

Sometimes permanent marking pens and heavy pencil lines will be difficult to conceal with light colored paints.

It also wouldn't be a bad idea to mark every riser and tread, because it's easy to get turned around, when laying out stair stringers. It isn't hard to imagine someone who didn't mark everything as I suggested, mistaking the top of the stairway for the bottom or vice versa.

This might be hard to imagine, especially after I just got through telling you what not to do, but I've even done it myself, more than once.

If you're a professional stair builder then you can do this stuff in your sleep. However, if you're just starting out, then I suggest you follow my instructions to the letter.

Here's something that could be useful, when laying out the top or bottom of your stair stringer. You can simply turn the framing square over and place it along the back of your stair stringer, if you need to mark something you won't be able to reach from the front.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©greg vanden berge

All stair tread and riser layout marks in this book will form 90° angles.

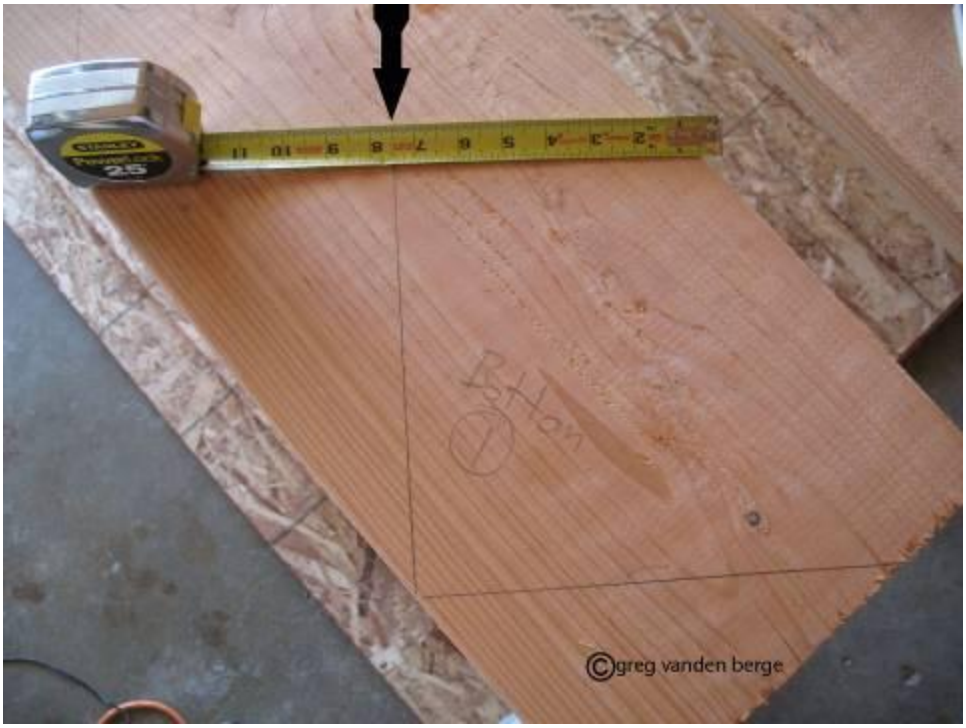
In the book," Advanced Stair Stringer Layout - Methods And Tips" you will be provided with additional angles, but for right now I'm assuming you're not ready for that… yet.

Bottom Stair Stringer Layout

In case you haven't noticed, I no longer have my stair gauges attached to the framing square and there's a good reason why. The stair gauges won't allow the framing square to lay flat on the board, so they were removed.

To mark the first riser all you need to do is line the 10 inch mark on the framing square up with the second riser mark on the stringer.

You should end up with this.



In the next step you will line your tape measure up with the riser height as shown in picture above.

This step is very important, so pay attention. This could make or break your stair building project.

You will need to subtract the tread thickness from the bottom of your stair stringer.

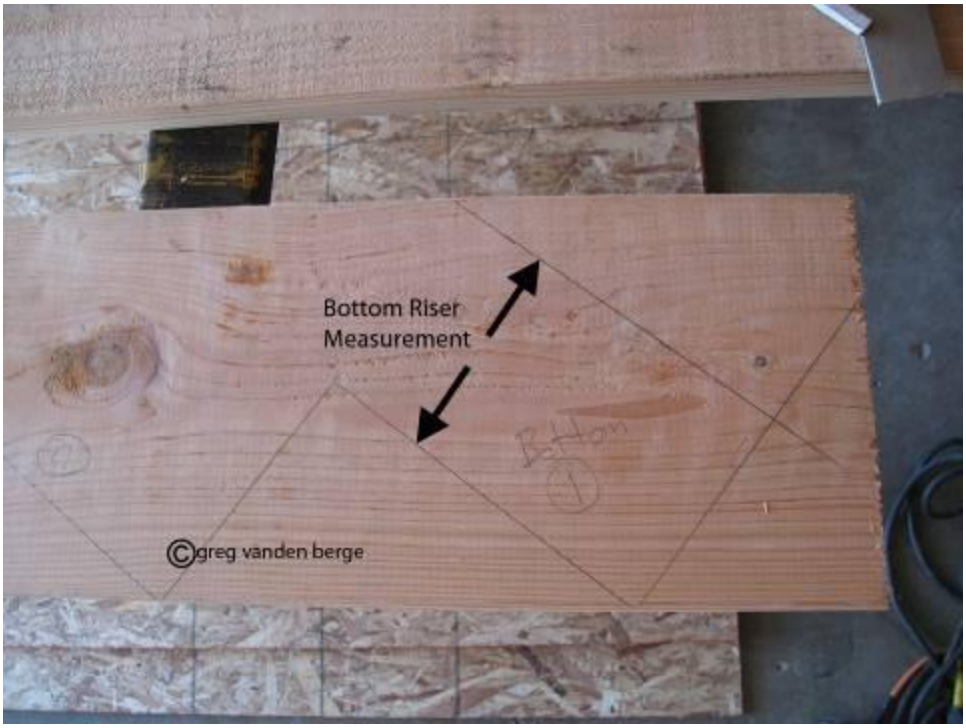
In the picture above we're subtracting an inch and a half.

The stair treads for this particular stairway will be 2 x 12's.

Make sure you measure the stair tread thickness, before marking the bottom of your stair stringer.

The black arrows are pointing to the two marks you'll need to draw a parallel line with the first stair step. The white arrow is pointing to the inch and a half mark on the tape measure.

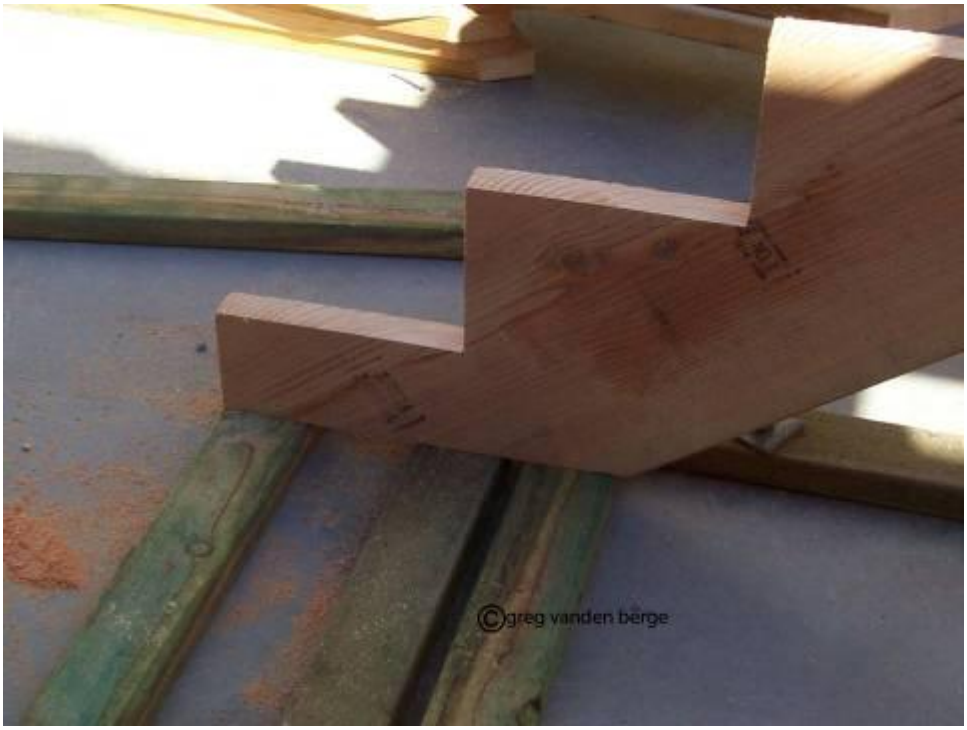
After that's done line up the framing square with the marks you've made and draw a straight line.

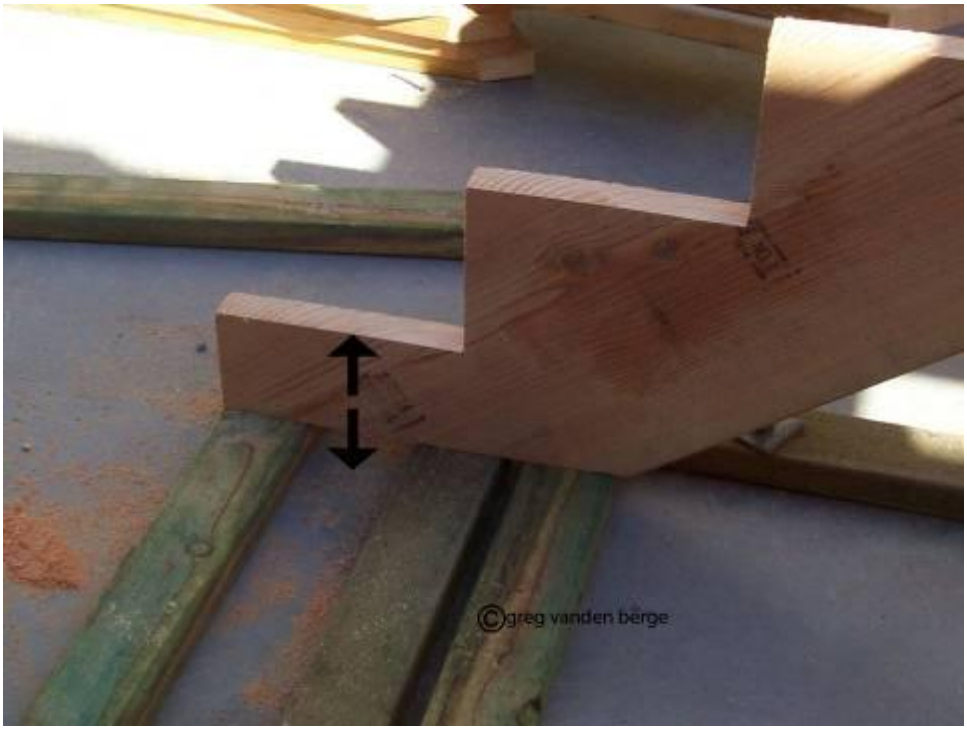


Bravo, you've just laid out the bottom of your stair stringer.

This is how the stair stringer will look after cut and installed.

You will also need to subtract the thickness of any lumber or other building materials your stair stringer will be sitting on.





The distance from the top of the lower floor to the top of the first step as shown in the picture above should equal your individual rise minus the thickness of your stair tread.

Take your time to verify these calculations and it also wouldn't be a bad idea to check it one more time, when you finally reach this phase of your stair building project.

When you finally have your first stair stringer properly positioned, (when building stairway) but before you nail it off completely, simply take your tape measure and measure from the floor to the top of the first step on your stair stringer, to validate this measurement, one last time.

If this doesn't make sense, it might make a little more sense if you place the stair tread on top of the first step of your stair stringer and then measure the distance from the floor to the top of the stair tread.

This measurement will represent your finished riser, without subtracting anything else.

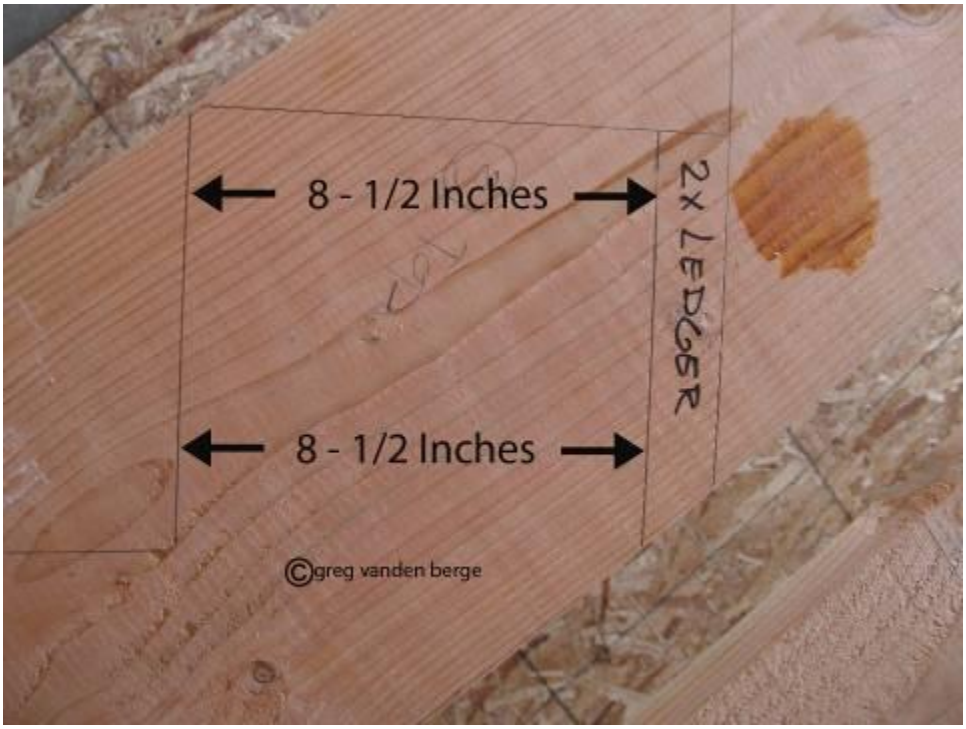
If your individual stair risers are 7 1/2 inches then this measurement should be 7 1/2 inches.

If you don't make these adjustments, then the first step of your stairway will be a little taller than the others.

Top Stair Stringer Layout With Ledger

Subtract the thickness of your ledger from the top step.

Then draw a parallel line with your stair risers.

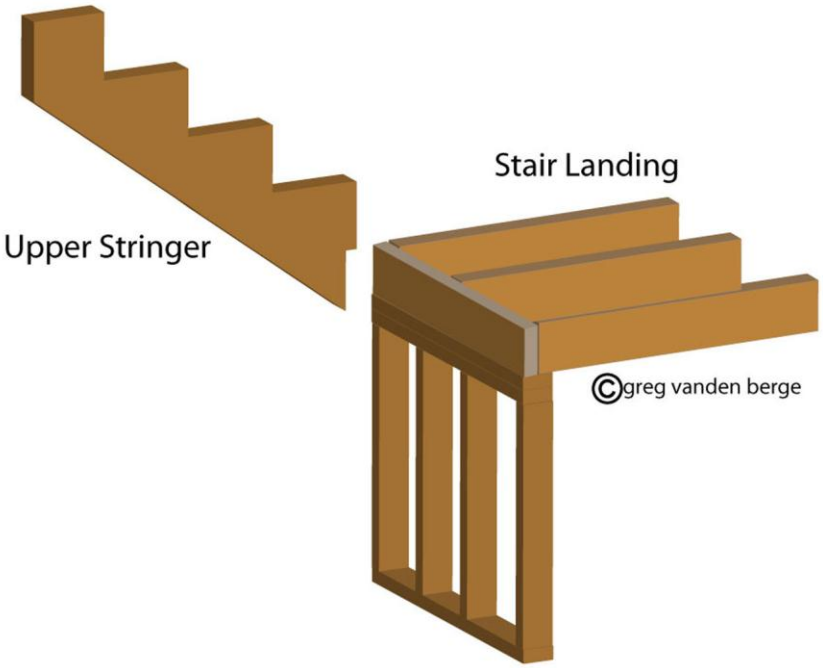


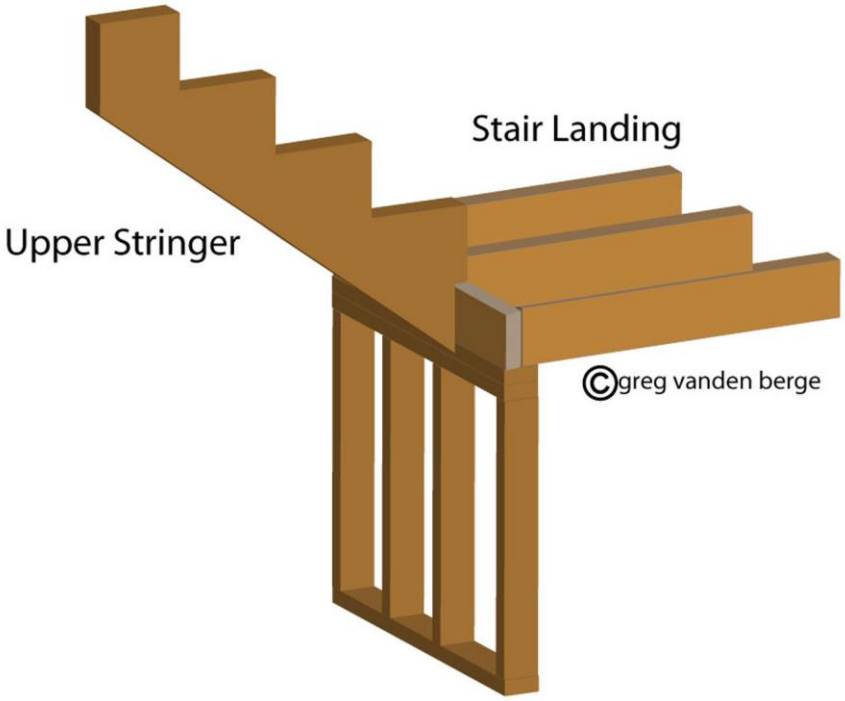
We subtracted an inch and a half from our overall 10 inch stair tread. When we finally end up attaching the stair stringer to the ledger, it will provide us with the 10 inch overall measurement we need to install our treads correctly.

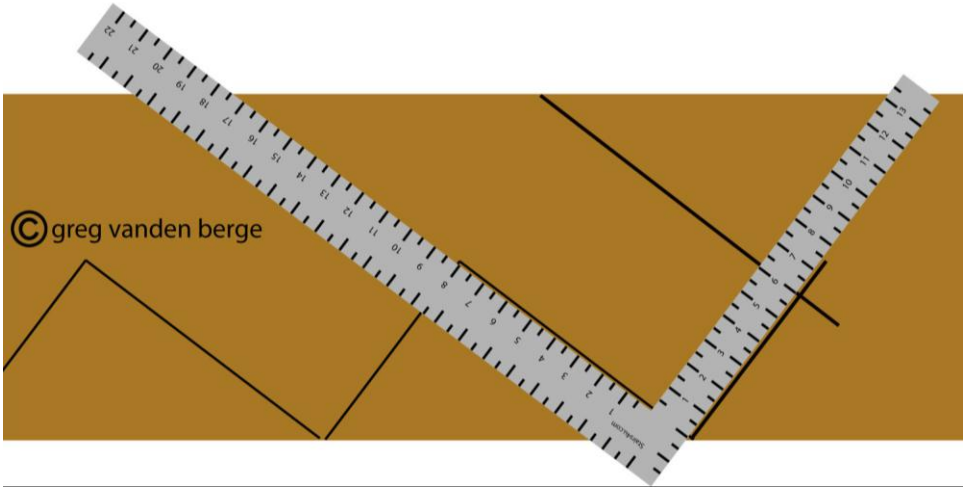
You're finished stair stringer should look something like this. Realistically, all stair stringers will have a top and bottom, the only difference will be the amount of steps in between.

Feel free to contact us by visiting http://stairs4u.com and scrolling down to the bottom of any page for our contact information. If you have any questions or ways I can improve this book, let me know.

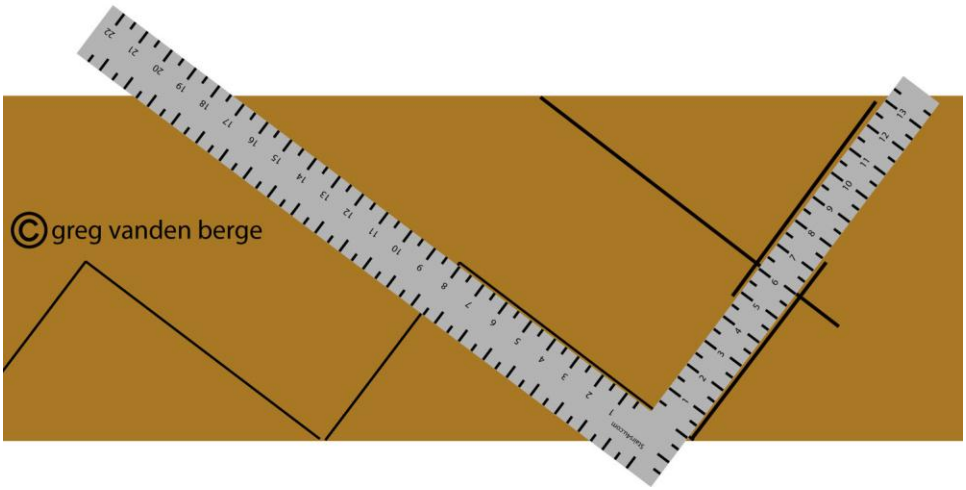
Simple Landing Method



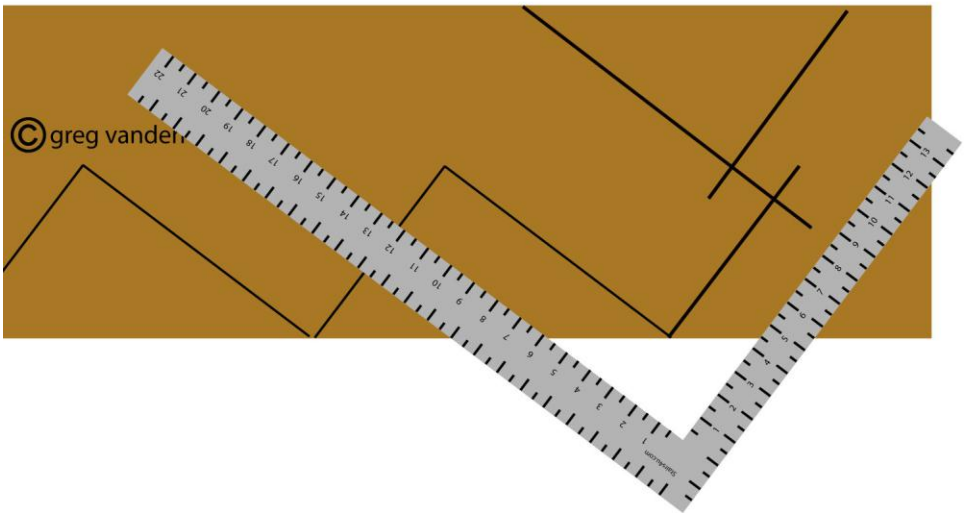




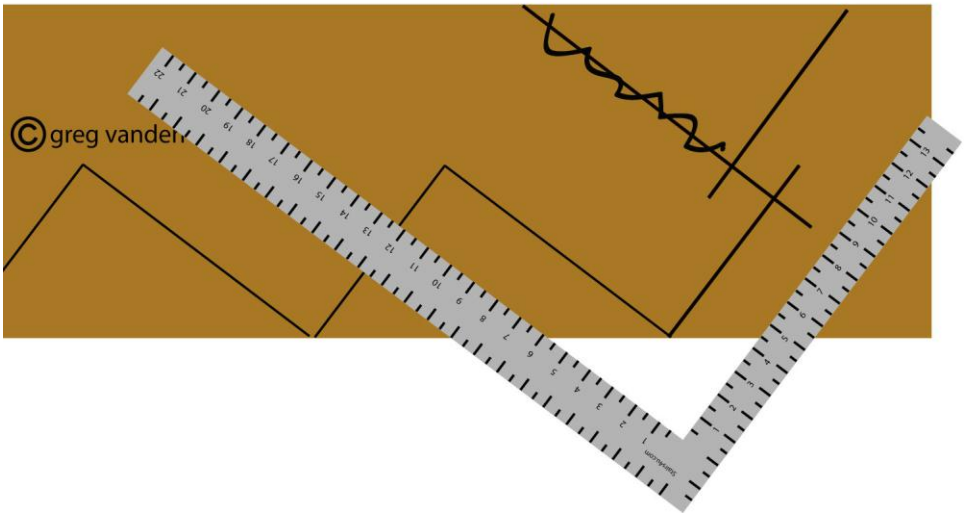
Step 1: Line the inch and a half side of your framing square up with bottom riser as shown in picture above.



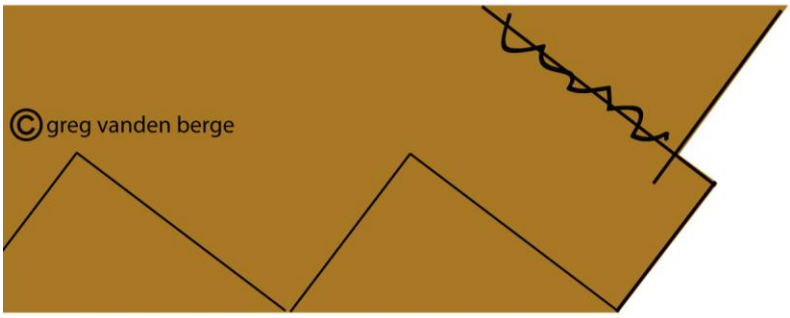
Step 2: After the framing square is properly positioned, mark as shown in picture above.



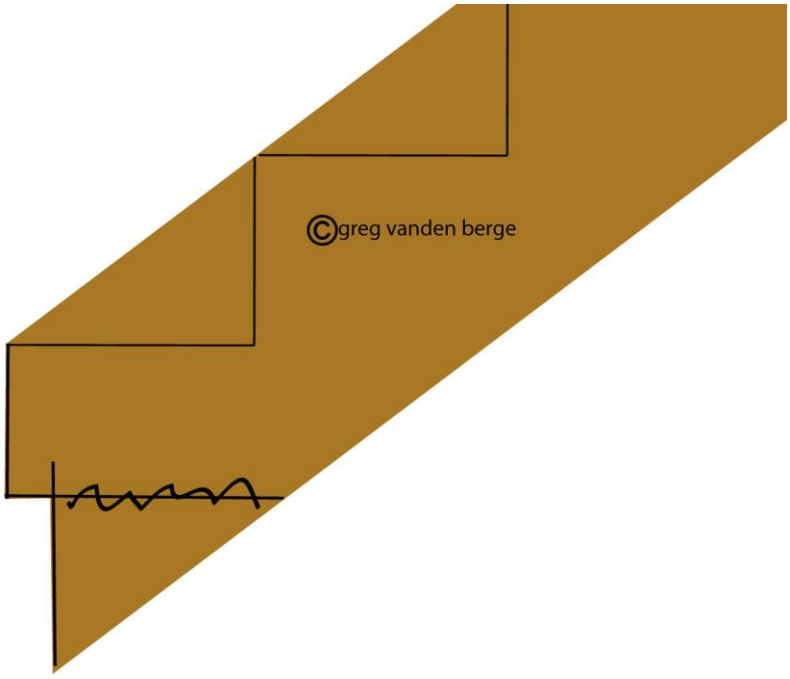
Step 3: You should end up with something like this.



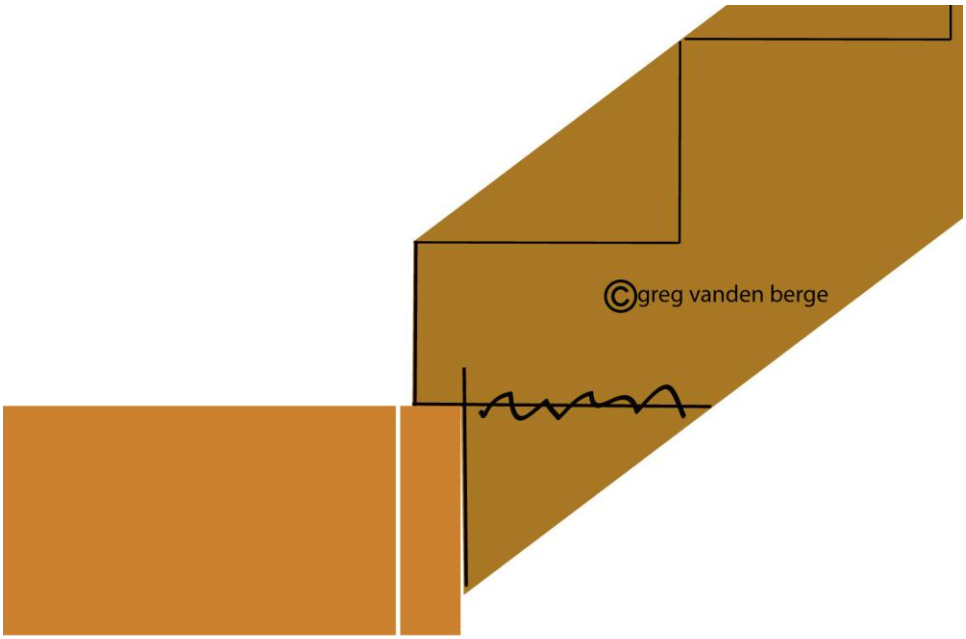
Step 4: Now this next part is extremely important. Make sure you cross out any lines you don't plan on cutting. I can't tell you how many times I cut one of these lines when I shouldn't have.



Step 5: The bottom of the stringer should look something like this after it's cut.



Step 6: I went ahead and flipped the stringer over, to give you a better idea what the stringer would look like, before attaching it to the landing.



Step 7: This is what the stringer would look like after it was attached to the landing. I've probably installed more than a thousand stairs using this method.

Stair Building Codes

The stair building codes listed in this book are from the Uniform Building Code and International Building Code books, but might not be current. You should always check with your local building department to verify any building codes listed in this book, before using them.

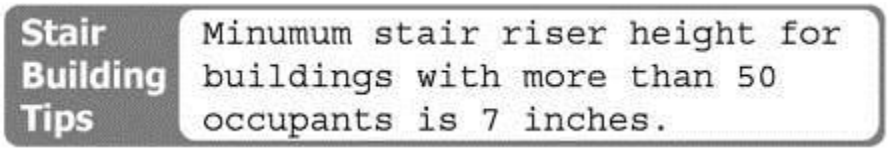
The stair building codes that are provided in this book are used as general guidelines for building stairs but don't apply to every situation. A good example of this would be the variations in building codes for commercial, industrial and public buildings.

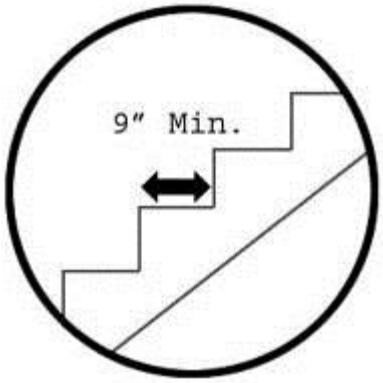
Commercial buildings might require additional gripable handrails that need to be attached to every set of stairs, throughout the property. Industrial stairs might require additional structural strength while public buildings will require additional stairways for fire escape routes.

Most building departments can be located through your local city or county government offices.

For more information about stair building codes, visit our website today. We've got one of the best stair building code sites on the Internet, so do yourself a favor and check it out.

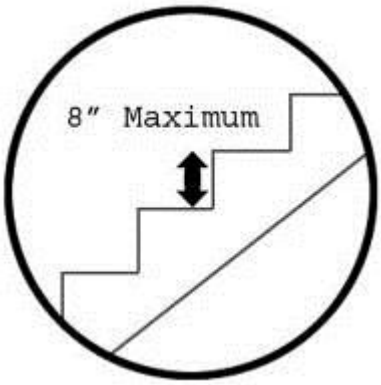
http://stairs4u.com/stairbuildingcodes.htm

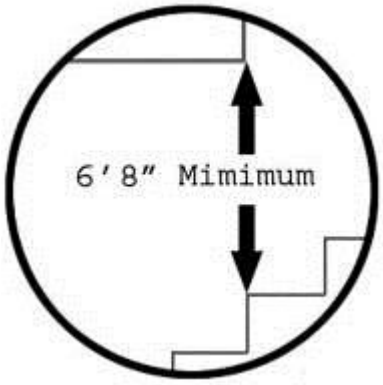




Stair Treads - The minimum width for a stair tread is 9 inches for private stairways and 11 inches for public stairways. Example: Measure the stair tread without the overhang or undercut and this will give you the individual tread run. Don't count overhangs or undercut in these measurements.

Stair Risers - Unlike stair treads who have a minimum width, stair risers shouldn't be larger than 8 inches in height. Public stairway building codes require a maximum of 7 inches in height. Example: If the total stair rise is 25 inches and you have 4 risers, then you've got a problem. You might need to add another riser to your stairway in order to meet local building code requirements.

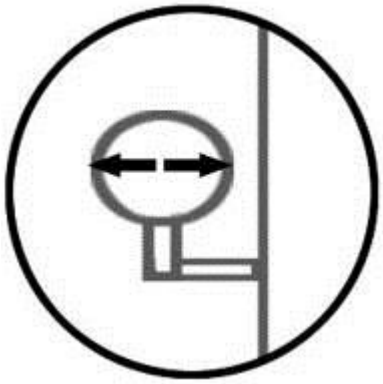




Head Room Clearance - The minimum head room required vertically in a stairway is 6'8". However, this measurement could be a problem for people who are 6 feet or taller. Example: Measure from the tip of the finished stair treads to the top of the ceiling above the stairway.

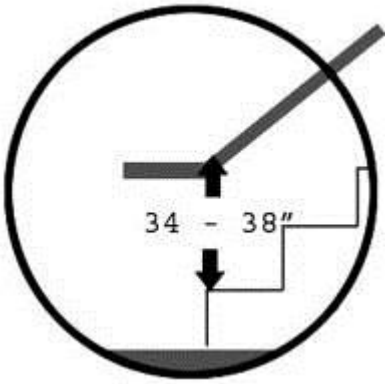
Guard Railing - The minimum height for a stairway guard railing is 42 inches, however I've been in new homes recently where they were 36 inches and don't know why.

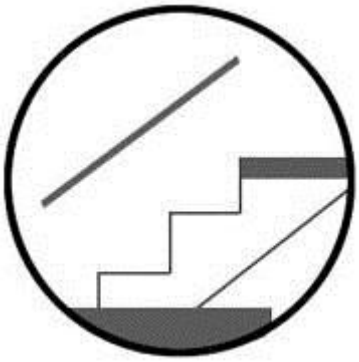
Example: Measure from the tip of the finished stair treads to the top of the stair handrailing.



Gripable Handrail - There are different size requirements for gripable handrailing. To give you a general idea, the width of the handrailing should be between 1 – 1/4 and 2 inches in diameter. Example: Measure the diameter of the handrail, not the length of the handrail.

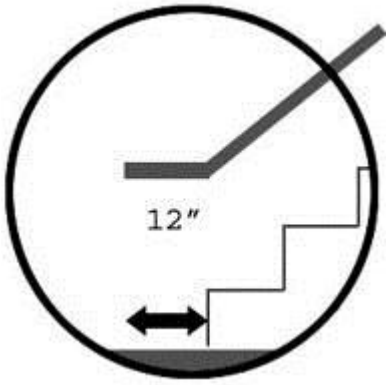
Gripable Handrail Height - Most building codes require a gripable handrail to run the entire length of the stairway. It shall be between 34 and 38 inches, measuring from the top of the finished stair tread nosing, to the top of the handrail. Example: The vertical measurement from the tip of the stair tread nosing to the top of the gripable handrail, should be between 34 and 38 inches.





Continuous Gripable Handrail - Most building codes require your stairway to have a gripable handrail that will run the entire length of the stairway without any breaks.
Example: The gripable handrail will start from the bottom of the stairs and continue all the way up until the stairway ends.

Baluster Spacing - This one gets a little tricky, you shouldn't be able to put a 4 inch sphere through the balusters. This also applies to other parts of the stairway. Example: If you have a ball that's 4 inches in diameter, you could use this to check your stairs, but we want to build it right the first time. This will require you to properly plan your stairway and handrail system to avoid any building code violations.



Handrailing Extension - Some building codes require you to extend the lower and upper gripable handrail at least 12 inches beyond the first tread and the last one. Example: Measure the distance from the end of the gripable handrail to the finished stair tread nosing. Remember the gripable handrailing can be longer, it just can't be shorter than 12 inches.

Stair Building Glossary

Visit our online glossary for more information or if there's a word we might have missed at http://stairs4u.com/glossary.htm

Anchor Bolts – Bolts that are embedded in the building foundation and used to attach building materials, like lumber to the foundation. Most anchor bolts are L-shaped and between 1/2 and 3/4" in diameter.

Balusters - These are vertical handrail components used to protect people from falling through the handrail or guard rail system. Balusters can be made from wood, metal and plastic.

Building Codes - A system of rules and regulations to create safer buildings. Most cities or counties throughout the United States regulate building codes through their building departments using building inspectors and other city officials.

Building Foundation - This is usually what a house or building rests upon. Foundations are usually built using concrete, block, cement or brick.

Building Hardware - Any nails, screws, nuts, bolts, hangers, connectors or other metal brackets used to connect one building component to another.

Cap - A piece of finish building material that usually runs at an angle, vertical or horizontal. Most solid drywall guardrails will use a 1 x 6 cap to finish the top of a wall off.

Cedar – Is a recommended wood used for exterior building projects like decks and stairs. Cedar can also be used on the interior of a house. Also see Redwood.

Ceiling - The overhead surface of a room, hallway and stairway. It's important to have enough distance between the ceiling and your head, for anyone who'll be walking up and down the stairs.

Construction Standard Lumber - Wood that is used primarily for framing and building homes. On the west coast of the United States they use Douglas Fir and on the East Coast they often use Southern Pine.

Diameter - The width of a circle, using a straight line that runs directly through the center.

Douglas Fir – A tall straight growing tree that provides plenty of lumber used for building homes throughout most western areas of the United States. Most construction standard lumber used in Southern California is Douglas Fir.

Drywall Spacer - Usually a 2 x 4 or 1 x 4 that attaches to one side of the stair stringer to allow a gap between the wall and the stringer to allow easy drywall installation around the stair stringer's.

First Floor - This would be the lower level of the building. The first floor would be a lower living area of a two-story house. The bottom of the stairway usually attaches to the first floor.

Framing Anchors - These can be made from lead, plastic or metal and are used to attach one type of building material to another. A good example of this would be using mechanical anchoring systems to attach treated lumber to a concrete building foundation.

Gripable Handrailing - This is the part of the handrailing system that's used to hold on to, while you're walking up and down a stairway. Most gripable handrail's are located between 34 and 38 inches from the top of the stair tread nosing and run the entire length of the stairway.

Guard Railing - Consists of balusters, handrailing and posts used to create a protective barrier to prevent people from falling from heights exceeding 30 inches, above the lower level.

Head Room - This is the vertical distance between the stair tread nosing and the ceiling above. This building code prevents taller people from hitting their heads on the ceiling, as they walk up and down the stairway.

Headout - Is located in the upper level floor joist system, where the stairway attaches to the upper floor. The stair stringers usually attach to the headout or a ledger, nailed directly underneath the headout.

Jack Studs - These are vertical wall studs that form the walls underneath a stair stringer. The bottom cut of the jack studs are usually square, while the top cut is angled.

Joist - These are the horizontal structural support members of the floor framing system that are used to support the floor. Floor joist are usually 2 x 6, 2 x 8, 2 x 10, 2 x 12 or 2 x 14 and also come in the form of engineered lumber, like truss joist.

Joist Hanger - These are the metal connectors used to connect the floor joist to another structural component of the floor joist system, like a beam. You can also use joist hangers to connect the stair stringers to a ledger or headout.

Lag Screws - Are screw type bolts with pointed tips that are used to attach building components together. Stair builders often use lag screws to attach 3 x 12 treads to 4 x 12 stringers, using special brackets.

Landing - A floor located somewhere in a stairway. A stairway could go up five steps and then turn 90° at a stair landing and then continue up to the second floor. A stair landing could also be located at the bottom or top of the stairway.

Layout - Marking, measuring and planning out the design of walls, floors, roofs or stairway components. Laying out a stair stringer is often referred to as the process for planning and creating the stair stringer, before cutting it.

Ledger - This is usually a horizontal building component that's used to attach two sections of the building together. A good example of this would be using a ledger that attaches to a wall, providing something solid for your stair stringers to attach to.

Nails – Pin shaped pieces of metal that comes in different sizes and can be used to attach wood together. Most stairway framers use 16-d and 8-d nails for stair building.

Newel Post - Are usually decorative wood posts used for supporting the handrailing system, located at the top, middle or bottom of a stairway. Newel posts often provide structural support for stairway handrails.

Nosing - This is the front of the stair tread or step. Some stair steps have a nosing that protrudes 1 inch away from the riser, while others don't protrude out at all, yet angle back in.

O.S.B. - Is often referred to as oriented strand board. This is a man-made product that requires gluing strands of lumber together, to produce an alternative building product to plywood.

Pattern - An original design created for the purpose of making copies. You can use patterns to make copies of stair stringers, treads and risers to speed up the stair assembly process.

Plywood - Is a man-made product made by gluing thin layers of lumber together with each layer changeing direction at 90° angles, increasing the strength of the product as additional layers are glued to it. Plywood is often used for floors, structural walls, stair treads and risers.

Posts - Structural components that provide support for a beam or strength for handrails. Guard rails usually have posts built into them, to provide additional strength.

Radius - Is half the diameter of a circle. The radius is also the measurement from the center to the outside of a circle.

Railing - This is normally referred to as the top of the handrail or guard rail system. If you were walking next to a guard rail, you could run your fingers along the top of the railing.

Redwood - Is a preferred wood used for building outdoor decks and stairways. Redwood comes in different grades and some of these grades are extremely expensive. I've heard other people say that termites won't eat Redwood, but that's not true.

Risers - These are the vertical sections of the stairway in between the treads or steps. Risers can be made from a variety of materials, but the most common are made from construction standard, hardwoods, soft woods, plywood’s and oriented strand board.

Screw - These are pieces of pin shaped metal with a threaded body that are often used to assemble home building products. Screws are often used instead of nails to provide additional holding power. Don't replace screws with nails, unless you have permission from the building designer, architect or engineer. Screws usually don't have the same sheer value a nail does.

Second Floor - This is usually the second level of a building. The top of the first stairway will attach to the second floor, while the bottom of the stairway attaches to the first level or floor. If you have a three level house, the bottom of the second set of stairs will attach to the second floor, while the top of the second stairway attaches to the third floor.

Sheathing - This is the material you will stand on, while walking around on a wood framed floor system. Sheathing is often referred to as underlayment. Most home builders use plywood or oriented strand board for sheathing.

Skirt Board - There are two types of skirt boards. The first type goes on the outside of the stair stringer and the second type separates your finished wall from the stairway. Both types of skirt boards are finished building products and are normally stained or painted.

Span - This would be the distance in between structural supports. The span will determine the thickness of stair treads, risers and floor sheathing.

Stairway - A passageway used to gain access from one level of the building to another. To get from the first floor of most houses to the second floor, a stairway is provided by the home builder for easy access.

Stairwell - This is an interior shape that's usually cut into a buildings floor framing system, to provide access to the second floor. The framing carpenter's who are responsible for building the second floor are also responsible for building the stairwell.

Stringer - The main structural support for almost any stairway. Stair stringers can be made out of wood or metal and usually support each tread and riser (step).

Stringer Layout – This is the process for marking out each individual stair tread and riser, on the stair stringer. This usually requires a framing square, along with the height of each riser and the width of each stair tread.

Total Rise - This is the vertical distance from the top of the bottom floor to the top of the top floor. If you had a 100 inch measurement from the top of the building foundation (lower level), to the top of the second floor sheathing, then the total rise would be 100 inches.

Total Run - This is the horizontal distance from the front of the first stair step, to the back of the last stair step. If you went horizontally from the stair headout, to the first floor and measured the distance to the first step, this would be the total run.

Tread Brackets - These are brackets used to attach stair treads to stair stringers. Most of these tread brackets can be purchased from your local home improvement center or lumber yard.

Tread Overhang - This is the distance each stair tread overhangs from the riser. Most building codes won't let you have a tread overhang longer than 1 - 1/4 inches.

Tread Under Cut - This is the distance the stair tread protrudes into the stair riser. Instead of an overhang at the front of the stair step, the riser will be angled back, at the bottom, providing more room for the stair step or tread.

Tread – Another word for the stair step, often used by building professionals. Stair treads can be made from a variety of materials, including concrete, wood and metal.

Treated Lumber - Is wood that has been pressure-treated with chemicals to reduce the chances of wood decay. Treated lumber is often used at the bottom of wood framed walls and stair stringers, to reduce the chances of wood rot or decay.

Visit our online glossary for more information or if there's a word we might have missed at http://stairs4u.com/glossary.htm

Rise And Run Chart For 10 Inch Treads

Total Rise = Total height of stairway, from the top of the bottom floor, to the top of the top floor.

Risers = Amount of risers in stairway.

Riser Height = Individual riser height or total height between steps.

Steps = Amount of steps in stairway.

Total Run = Length of stairway in inches, using a 10 inch step or stair tread.

Angle = This is the angle of the stairway or incline.

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
10	2	5.00	1	10	26.57
10.25	2	5.13	1	10	27.14
10.5	2	5.25	1	10	27.70
10.75	2	5.38	1	10	28.26
10.75	2	5.38	1	10	28.26
11.25	2	5.63	1	10	29.36
11.5	2	5.75	1	10	29.90
11.75	2	5.88	1	10	30.43
12	2	6.00	1	10	30.96
12.25	2	6.13	1	10	31.49
12.5	2	6.25	1	10	32.01
12.75	2	6.38	1	10	32.52
13	2	6.50	1	10	33.02
13.25	2	6.63	1	10	33.52
13.5	2	6.75	1	10	34.02
13.75	2	6.88	1	10	34.51
14	2	7.00	1	10	34.99
14.25	2	7.13	1	10	35.47
14.5	2	7.25	1	10	35.94
14.75	2	7.38	1	10	36.41

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
15	2	7.50	1	10	36.87
15.25	2	7.63	1	10	37.33
15.5	2	7.75	1	10	37.78
15.75	3	5.25	2	20	27.70
16	3	5.33	2	20	28.07
16.25	3	5.42	2	20	28.44
16.5	3	5.50	2	20	28.81
16.75	3	5.58	2	20	29.18
17	3	5.67	2	20	29.54
17.25	3	5.75	2	20	29.90
17.5	3	5.83	2	20	30.26
17.75	3	5.92	2	20	30.61
18	3	6.00	2	20	30.96
18.25	3	6.08	2	20	31.31
18.5	3	6.17	2	20	31.66
18.75	3	6.25	2	20	32.01
19	3	6.33	2	20	32.35
19.25	3	6.42	2	20	32.69
19.5	3	6.50	2	20	33.02
19.75	3	6.58	2	20	33.36
20	3	6.67	2	20	33.69
20.25	3	6.75	2	20	34.02
20.5	3	6.83	2	20	34.35
20.75	3	6.92	2	20	34.67
21	3	7.00	2	20	34.99
21.25	3	7.08	2	20	35.31
21.5	3	7.17	2	20	35.63
21.75	3	7.25	2	20	35.94
22	3	7.33	2	20	36.25
22.25	3	7.42	2	20	36.56
22.5	3	7.50	2	20	36.87
22.75	3	7.58	2	20	37.17
23	3	7.67	2	20	37.48
23.25	3	7.75	2	20	37.78
23.5	4	5.88	3	30	30.43
23.75	4	5.94	3	30	30.70

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
24.25	4	6.06	3	30	31.23
24.5	4	6.13	3	30	31.49
24.75	4	6.19	3	30	31.75
25	4	6.25	3	30	32.01
25.25	4	6.31	3	30	32.26
25.5	4	6.38	3	30	32.52
25.75	4	6.44	3	30	32.77
26	4	6.50	3	30	33.02
26.25	4	6.56	3	30	33.27
26.5	4	6.63	3	30	33.52
26.75	4	6.69	3	30	33.77
27	4	6.75	3	30	34.02
27.25	4	6.81	3	30	34.26
27.5	4	6.88	3	30	34.51
27.75	4	6.94	3	30	34.75
28	4	7.00	3	30	34.99
28.25	4	7.06	3	30	35.23
28.5	4	7.13	3	30	35.47
28.75	4	7.19	3	30	35.71
29	4	7.25	3	30	35.94
29.25	4	7.31	3	30	36.18
29.5	4	7.38	3	30	36.41
29.75	4	7.44	3	30	36.64
30	4	7.50	3	30	36.87
30.25	4	7.56	3	30	37.10
30.5	4	7.63	3	30	37.33
30.75	4	7.69	3	30	37.55
31	4	7.75	3	30	37.78
31.25	5	6.25	4	40	32.01
31.5	5	6.30	4	40	32.21
31.75	5	6.35	4	40	32.42
32	5	6.40	4	40	32.62
32.25	5	6.45	4	40	32.82
32.5	5	6.50	4	40	33.02
32.75	5	6.55	4	40	33.22
33	5	6.60	4	40	33.42

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
33.25	5	6.65	4	40	33.62
33.5	5	6.70	4	40	33.82
33.75	5	6.75	4	40	34.02
34	5	6.80	4	40	34.22
34.25	5	6.85	4	40	34.41
34.5	5	6.90	4	40	34.61
34.75	5	6.95	4	40	34.80
35	5	7.00	4	40	34.99
35.25	5	7.05	4	40	35.18
35.5	5	7.10	4	40	35.37
35.75	5	7.15	4	40	35.56
36	5	7.20	4	40	35.75
36.25	5	7.25	4	40	35.94
36.5	5	7.30	4	40	36.13
36.75	5	7.35	4	40	36.32
37	5	7.40	4	40	36.50
37.25	5	7.45	4	40	36.69
37.5	5	7.50	4	40	36.87
37.75	5	7.55	4	40	37.05
38	5	7.60	4	40	37.23
38.25	5	7.65	4	40	37.42
38.5	5	7.70	4	40	37.60
38.75	5	7.75	4	40	37.78
39	6	6.50	5	50	33.02
39.25	6	6.54	5	50	33.19
39.5	6	6.58	5	50	33.36
39.75	6	6.63	5	50	33.52
40	6	6.67	5	50	33.69
40.25	6	6.71	5	50	33.86
40.5	6	6.75	5	50	34.02
40.75	6	6.79	5	50	34.18
41	6	6.83	5	50	34.35
41.25	6	6.88	5	50	34.51
41.5	6	6.92	5	50	34.67
41.75	6	6.96	5	50	34.83
42	6	7.00	5	50	34.99

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
42.25	6	7.04	5	50	35.15
42.5	6	7.08	5	50	35.31
42.75	6	7.13	5	50	35.47
43	6	7.17	5	50	35.63
43.25	6	7.21	5	50	35.79
43.5	6	7.25	5	50	35.94
43.75	6	7.29	5	50	36.10
44	6	7.33	5	50	36.25
44.25	6	7.38	5	50	36.41
44.5	6	7.42	5	50	36.56
44.75	6	7.46	5	50	36.72
45	6	7.50	5	50	36.87
45.25	6	7.54	5	50	37.02
45.5	6	7.58	5	50	37.17
45.75	6	7.63	5	50	37.33
46	6	7.67	5	50	37.48
46.25	6	7.71	5	50	37.63
46.5	6	7.75	5	50	37.78
46.75	7	6.68	6	60	33.74
47	7	6.71	6	60	33.88
47.25	7	6.75	6	60	34.02
47.5	7	6.79	6	60	34.16
47.75	7	6.82	6	60	34.30
48	7	6.86	6	60	34.44
48.25	7	6.89	6	60	34.58
48.5	7	6.93	6	60	34.72
48.75	7	6.96	6	60	34.85
49	7	7.00	6	60	34.99
49.25	7	7.04	6	60	35.13
49.5	7	7.07	6	60	35.27
49.75	7	7.11	6	60	35.40
50	7	7.14	6	60	35.54
5.25	7	0.75	6	60	4.29
50.5	7	7.21	6	60	35.81
50.75	7	7.25	6	60	35.94
51	7	7.29	6	60	36.08

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
51.25	7	7.32	6	60	36.21
51.5	7	7.36	6	60	36.34
51.75	7	7.39	6	60	36.47
52	7	7.43	6	60	36.61
52.25	7	7.46	6	60	36.74
52.5	7	7.50	6	60	36.87
52.75	7	7.54	6	60	37.00
53	7	7.57	6	60	37.13
53.25	7	7.61	6	60	37.26
53.5	7	7.64	6	60	37.39
53.75	7	7.68	6	60	37.52
54	7	7.71	6	60	37.65
54.25	7	7.75	6	60	37.78
54.5	8	6.81	7	70	34.26
54.75	8	6.84	7	70	34.39
55	8	6.88	7	70	34.51
55.25	8	6.91	7	70	34.63
55.5	8	6.94	7	70	34.75
55.75	8	6.97	7	70	34.87
56	8	7.00	7	70	34.99
56.25	8	7.03	7	70	35.11
56.5	8	7.06	7	70	35.23
56.75	8	7.09	7	70	35.35
57	8	7.13	7	70	35.47
57.25	8	7.16	7	70	35.59
57.5	8	7.19	7	70	35.71
57.75	8	7.22	7	70	35.82
58	8	7.25	7	70	35.94
58.25	8	7.28	7	70	36.06
58.5	8	7.31	7	70	36.18
58.75	8	7.34	7	70	36.29
59	8	7.38	7	70	36.41
59.25	8	7.41	7	70	36.52
59.5	8	7.44	7	70	36.64
59.75	8	7.47	7	70	36.76
60	8	7.50	7	70	36.87

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
60.25	8	7.53	7	70	36.98
60.5	8	7.56	7	70	37.10
60.75	8	7.59	7	70	37.21
61	8	7.63	7	70	37.33
61.25	8	7.66	7	70	37.44
61.5	8	7.69	7	70	37.55
61.75	8	7.72	7	70	37.66
62	8	7.75	7	70	37.78
62.25	9	6.92	8	80	34.67
62.5	9	6.94	8	80	34.78
62.75	9	6.97	8	80	34.89
63	9	7.00	8	80	34.99
63.25	9	7.03	8	80	35.10
63.5	9	7.06	8	80	35.21
63.75	9	7.08	8	80	35.31
64	9	7.11	8	80	35.42
64.25	9	7.14	8	80	35.52
64.5	9	7.17	8	80	35.63
64.75	9	7.19	8	80	35.73
65	9	7.22	8	80	35.84
65.25	9	7.25	8	80	35.94
65.5	9	7.28	8	80	36.05
65.75	9	7.31	8	80	36.15
66	9	7.33	8	80	36.25
66.25	9	7.36	8	80	36.36
66.5	9	7.39	8	80	36.46
66.75	9	7.42	8	80	36.56
67	9	7.44	8	80	36.67
67.25	9	7.47	8	80	36.77
67.5	9	7.50	8	80	36.87
67.75	9	7.53	8	80	36.97
68	9	7.56	8	80	37.07
68.25	9	7.58	8	80	37.17
68.5	9	7.61	8	80	37.28
68.75	9	7.64	8	80	37.38
69	10	6.90	9	90	34.61

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
69.25	10	6.93	9	90	34.70
69.5	10	6.95	9	90	34.80
69.75	10	6.98	9	90	34.90
70	10	7.00	9	90	34.99
70.25	10	7.03	9	90	35.09
70.5	10	7.05	9	90	35.18
70.75	10	7.08	9	90	35.28
71	10	7.10	9	90	35.37
71.25	10	7.13	9	90	35.47
71.5	10	7.15	9	90	35.56
71.75	10	7.18	9	90	35.66
72	10	7.20	9	90	35.75
72.25	10	7.23	9	90	35.85
72.5	10	7.25	9	90	35.94
72.75	10	7.28	9	90	36.04
73	10	7.30	9	90	36.13
73.25	10	7.33	9	90	36.22
73.5	10	7.35	9	90	36.32
73.75	10	7.38	9	90	36.41
74	10	7.40	9	90	36.50
74.25	10	7.43	9	90	36.59
74.5	10	7.45	9	90	36.69
74.75	10	7.48	9	90	36.78
75	10	7.50	9	90	36.87
75.25	10	7.53	9	90	36.96
75.5	10	7.55	9	90	37.05
75.75	10	7.58	9	90	37.14
76	10	7.60	9	90	37.23
76.25	10	7.63	9	90	37.33
76.5	11	6.95	10	100	34.82
76.75	11	6.98	10	100	34.90
77	11	7.00	10	100	34.99
77.25	11	7.02	10	100	35.08
77.5	11	7.05	10	100	35.17
77.75	11	7.07	10	100	35.25
78	11	7.09	10	100	35.34

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
78.25	11	7.11	10	100	35.43
78.5	11	7.14	10	100	35.51
78.75	11	7.16	10	100	35.60
79	11	7.18	10	100	35.69
79.25	11	7.20	10	100	35.77
79.5	11	7.23	10	100	35.86
79.75	11	7.25	10	100	35.94
80	11	7.27	10	100	36.03
80.25	11	7.30	10	100	36.11
80.5	11	7.32	10	100	36.20
80.75	11	7.34	10	100	36.28
81	11	7.36	10	100	36.37
81.25	11	7.39	10	100	36.45
81.5	11	7.41	10	100	36.54
81.75	11	7.43	10	100	36.62
82	11	7.45	10	100	36.70
82.25	11	7.48	10	100	36.79
82.5	11	7.50	10	100	36.87
82.75	11	7.52	10	100	36.95
83	11	7.55	10	100	37.04
83.25	11	7.57	10	100	37.12
83.5	11	7.59	10	100	37.20
83.75	11	7.61	10	100	37.28
84	11	7.64	10	100	37.37
84.25	12	7.02	11	110	35.07
84.5	12	7.04	11	110	35.15
84.75	12	7.06	11	110	35.23
85	12	7.08	11	110	35.31
85.25	12	7.10	11	110	35.39
85.5	12	7.13	11	110	35.47
85.75	12	7.15	11	110	35.55
86	12	7.17	11	110	35.63
86.25	12	7.19	11	110	35.71
86.5	12	7.21	11	110	35.79
86.75	12	7.23	11	110	35.86
87	12	7.25	11	110	35.94

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
87.25	12	7.27	11	110	36.02
87.5	12	7.29	11	110	36.10
87.75	12	7.31	11	110	36.18
88	12	7.33	11	110	36.25
88.25	12	7.35	11	110	36.33
88.5	12	7.38	11	110	36.41
88.75	12	7.40	11	110	36.49
89	12	7.42	11	110	36.56
89.25	12	7.44	11	110	36.64
89.5	12	7.46	11	110	36.72
89.75	12	7.48	11	110	36.79
90	12	7.50	11	110	36.87
90.25	12	7.52	11	110	36.95
90.5	12	7.54	11	110	37.02
90.75	12	7.56	11	110	37.10
91	12	7.58	11	110	37.17
91.25	13	7.02	12	120	35.07
91.5	13	7.04	12	120	35.14
91.75	13	7.06	12	120	35.21
92	13	7.08	12	120	35.29
92.25	13	7.10	12	120	35.36
92.5	13	7.12	12	120	35.43
92.75	13	7.13	12	120	35.51
93	13	7.15	12	120	35.58
93.25	13	7.17	12	120	35.65
93.5	13	7.19	12	120	35.72
93.75	13	7.21	12	120	35.80
94	13	7.23	12	120	35.87
94.25	13	7.25	12	120	35.94
94.5	13	7.27	12	120	36.01
94.75	13	7.29	12	120	36.09
95	13	7.31	12	120	36.16
95.25	13	7.33	12	120	36.23
95.5	13	7.35	12	120	36.30
95.75	13	7.37	12	120	36.37
96	13	7.38	12	120	36.44

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
96.25	13	7.40	12	120	36.52
96.5	13	7.42	12	120	36.59
96.75	13	7.44	12	120	36.66
97	13	7.46	12	120	36.73
97.25	13	7.48	12	120	36.80
97.5	13	7.50	12	120	36.87
97.75	13	7.52	12	120	36.94
98	14	7.00	13	130	34.99
98.25	14	7.02	13	130	35.06
98.5	14	7.04	13	130	35.13
98.75	14	7.05	13	130	35.20
99	14	7.07	13	130	35.27
99.25	14	7.09	13	130	35.33
99.5	14	7.11	13	130	35.40
99.75	14	7.13	13	130	35.47
100	14	7.14	13	130	35.54
100.25	14	7.16	13	130	35.61
100.5	14	7.18	13	130	35.67
100.75	14	7.20	13	130	35.74
101	14	7.21	13	130	35.81
101.25	14	7.23	13	130	35.87
101.5	14	7.25	13	130	35.94
101.75	14	7.27	13	130	36.01
102	14	7.29	13	130	36.08
102.25	14	7.30	13	130	36.14
102.5	14	7.32	13	130	36.21
102.75	14	7.34	13	130	36.28
103	14	7.36	13	130	36.34
103.25	14	7.38	13	130	36.41
103.5	14	7.39	13	130	36.47
103.75	14	7.41	13	130	36.54
104	14	7.43	13	130	36.61
104.25	14	7.45	13	130	36.67
104.5	14	7.46	13	130	36.74
104.75	14	7.48	13	130	36.80
105	14	7.50	13	130	36.87

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
105.25	15	7.02	14	140	35.06
105.5	15	7.03	14	140	35.12
105.75	15	7.05	14	140	35.18
106	15	7.07	14	140	35.25
106.25	15	7.08	14	140	35.31
106.5	15	7.10	14	140	35.37
106.75	15	7.12	14	140	35.44
107	15	7.13	14	140	35.50
107.25	15	7.15	14	140	35.56
107.5	15	7.17	14	140	35.63
107.75	15	7.18	14	140	35.69
108	15	7.20	14	140	35.75
108.25	15	7.22	14	140	35.82
108.5	15	7.23	14	140	35.88
108.75	15	7.25	14	140	35.94
109	15	7.27	14	140	36.00
109.25	15	7.28	14	140	36.07
109.5	15	7.30	14	140	36.13
109.75	15	7.32	14	140	36.19
110	15	7.33	14	140	36.25
110.25	15	7.35	14	140	36.32
110.5	15	7.37	14	140	36.38
110.75	15	7.38	14	140	36.44
111	15	7.40	14	140	36.50
111.25	15	7.42	14	140	36.56
111.5	15	7.43	14	140	36.62
111.75	15	7.45	14	140	36.69
112	15	7.47	14	140	36.75
112.25	15	7.48	14	140	36.81
112.5	15	7.50	14	140	36.87
112.75	16	7.05	15	150	35.17
113	16	7.06	15	150	35.23
113.25	16	7.08	15	150	35.29
113.5	16	7.09	15	150	35.35
113.75	16	7.11	15	150	35.41
114	16	7.13	15	150	35.47

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
114.25	16	7.14	15	150	35.53
114.5	16	7.16	15	150	35.59
114.75	16	7.17	15	150	35.65
115	16	7.19	15	150	35.71
115.25	16	7.20	15	150	35.77
115.5	16	7.22	15	150	35.82
115.75	16	7.23	15	150	35.88
116	16	7.25	15	150	35.94
116.25	16	7.27	15	150	36.00
116.5	16	7.28	15	150	36.06
116.75	16	7.30	15	150	36.12
117	16	7.31	15	150	36.18
117.25	16	7.33	15	150	36.23
117.5	16	7.34	15	150	36.29
117.75	16	7.36	15	150	36.35
118	16	7.38	15	150	36.41
118.25	16	7.39	15	150	36.47
118.5	16	7.41	15	150	36.52
118.75	16	7.42	15	150	36.58
119	16	7.44	15	150	36.64
119.25	16	7.45	15	150	36.70
119.5	16	7.47	15	150	36.76
119.75	16	7.48	15	150	36.81
120	16	7.50	15	150	36.87
120.25	17	7.07	16	160	35.27
120.5	17	7.09	16	160	35.33
120.75	17	7.10	16	160	35.39
121	17	7.12	16	160	35.44
121.25	17	7.13	16	160	35.50
121.5	17	7.15	16	160	35.55
121.75	17	7.16	16	160	35.61
122	17	7.18	16	160	35.67
122.25	17	7.19	16	160	35.72
122.5	17	7.21	16	160	35.78
122.75	17	7.22	16	160	35.83
123	17	7.24	16	160	35.89

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
123.25	17	7.25	16	160	35.94
123.5	17	7.26	16	160	36.00
123.75	17	7.28	16	160	36.05
124	17	7.29	16	160	36.11
124.25	17	7.31	16	160	36.16
124.5	17	7.32	16	160	36.22
124.75	17	7.34	16	160	36.27
125	17	7.35	16	160	36.33
125.25	17	7.37	16	160	36.38
125.5	17	7.38	16	160	36.44
125.75	17	7.40	16	160	36.49
126	17	7.41	16	160	36.54
126.25	17	7.43	16	160	36.60
126.5	17	7.44	16	160	36.65
126.75	17	7.46	16	160	36.71
127	17	7.47	16	160	36.76
127.25	17	7.49	16	160	36.82
127.5	17	7.50	16	160	36.87
127.75	18	7.10	17	170	35.36
128	18	7.11	17	170	35.42
128.25	18	7.13	17	170	35.47
128.5	18	7.14	17	170	35.52
128.75	18	7.15	17	170	35.58
129	18	7.17	17	170	35.63
129.25	18	7.18	17	170	35.68
129.5	18	7.19	17	170	35.73
129.75	18	7.21	17	170	35.79
130	18	7.22	17	170	35.84
130.25	18	7.24	17	170	35.89
130.5	18	7.25	17	170	35.94
130.75	18	7.26	17	170	35.99
131	18	7.28	17	170	36.05
131.25	18	7.29	17	170	36.10
131.5	18	7.31	17	170	36.15
131.75	18	7.32	17	170	36.20
132	18	7.33	17	170	36.25

Total Rise	Risers	Riser Height	Steps	Total Run	Angle
132.25	18	7.35	17	170	36.31
132.5	18	7.36	17	170	36.36
132.75	18	7.38	17	170	36.41
133	18	7.39	17	170	36.46
133.25	18	7.40	17	170	36.51
133.5	18	7.42	17	170	36.56
133.75	18	7.43	17	170	36.61
134	18	7.44	17	170	36.67
134.25	18	7.46	17	170	36.72
134.5	18	7.47	17	170	36.77
134.75	18	7.49	17	170	36.82
135	18	7.50	17	170	36.87
135.25	19	7.12	18	180	35.44
135.5	19	7.13	18	180	35.49
135.75	19	7.14	18	180	35.54
135	19	7.11	18	180	35.39
135.25	19	7.12	18	180	35.44
135.5	19	7.13	18	180	35.49
135.75	19	7.14	18	180	35.54
136	19	7.16	18	180	35.59
136.25	19	7.17	18	180	35.64
136.5	19	7.18	18	180	35.69
136.75	19	7.20	18	180	35.74
137	19	7.21	18	180	35.79
137.25	19	7.22	18	180	35.84
137.5	19	7.24	18	180	35.89
137.75	19	7.25	18	180	35.94
138	19	7.26	18	180	35.99
138.25	19	7.28	18	180	36.04
138.5	19	7.29	18	180	36.09
138.75	19	7.30	18	180	36.14
139	19	7.32	18	180	36.19
139.25	19	7.33	18	180	36.24
139.5	19	7.34	18	180	36.29
139.75	19	7.36	18	180	36.34
140	19	7.37	18	180	36.38

Rise And Run Chart For 17 – ½ Inch Rule

Total Rise = Total height of stairway, from the top of the bottom floor, to the top of the top floor.

Risers = Amount of risers in stairway.

Riser Height = Individual riser height or total height between steps.

Steps = Amount of steps in stairway.

Total Run = Length of stairway in inches, while subtracting height of riser from 17.5 inches.

Angle = This is the angle of the stairway or incline.

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
10	2	5.00	1	12.50	12.50	21.80
10.25	2	5.13	1	12.38	12.38	22.50
10.5	2	5.25	1	12.25	12.25	23.20
10.75	2	5.38	1	12.13	12.13	23.91
10.75	2	5.38	1	12.13	12.13	23.91
11.25	2	5.63	1	11.88	11.88	25.35
11.5	2	5.75	1	11.75	11.75	26.08
11.75	2	5.88	1	11.63	11.63	26.81
12	2	6.00	1	11.50	11.50	27.55
12.25	2	6.13	1	11.38	11.38	28.30
12.5	2	6.25	1	11.25	11.25	29.05
12.75	2	6.38	1	11.13	11.13	29.81
13	2	6.50	1	11.00	11.00	30.58
13.25	2	6.63	1	10.88	10.88	31.35
13.5	2	6.75	1	10.75	10.75	32.12
13.75	2	6.88	1	10.63	10.63	32.91
14	2	7.00	1	10.50	10.50	33.69
14.25	2	7.13	1	10.38	10.38	34.48
14.5	2	7.25	1	10.25	10.25	35.27
14.75	2	7.38	1	10.13	10.13	36.07
15	2	7.50	1	10.00	10.00	36.87
15.25	2	7.63	1	9.88	9.88	37.67
15.5	2	7.75	1	9.75	9.75	38.48
15.75	3	5.25	2	12.25	24.50	23.20

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
16	3	5.33	2	12.17	24.33	23.67
16.25	3	5.42	2	12.08	24.17	24.15
16.5	3	5.50	2	12.00	24.00	24.62
16.75	3	5.58	2	11.92	23.83	25.10
17	3	5.67	2	11.83	23.67	25.59
17.25	3	5.75	2	11.75	23.50	26.08
17.5	3	5.83	2	11.67	23.33	26.57
17.75	3	5.92	2	11.58	23.17	27.06
18	3	6.00	2	11.50	23.00	27.55
18.25	3	6.08	2	11.42	22.83	28.05
18.5	3	6.17	2	11.33	22.67	28.55
18.75	3	6.25	2	11.25	22.50	29.05
19	3	6.33	2	11.17	22.33	29.56
19.25	3	6.42	2	11.08	22.17	30.07
19.5	3	6.50	2	11.00	22.00	30.58
19.75	3	6.58	2	10.92	21.83	31.09
20	3	6.67	2	10.83	21.67	31.61
20.25	3	6.75	2	10.75	21.50	32.12
20.5	3	6.83	2	10.67	21.33	32.64
20.75	3	6.92	2	10.58	21.17	33.17
21	3	7.00	2	10.50	21.00	33.69
21.25	3	7.08	2	10.42	20.83	34.22
21.5	3	7.17	2	10.33	20.67	34.74
21.75	3	7.25	2	10.25	20.50	35.27
22	3	7.33	2	10.17	20.33	35.80
22.25	3	7.42	2	10.08	20.17	36.34
22.5	3	7.50	2	10.00	20.00	36.87
22.75	3	7.58	2	9.92	19.83	37.41
23	3	7.67	2	9.83	19.67	37.94
23.25	3	7.75	2	9.75	19.50	38.48
23.5	4	5.88	3	11.63	34.88	26.81
23.75	4	5.94	3	11.56	34.69	27.18
24	4	6.00	3	11.50	34.50	27.55
24.25	4	6.06	3	11.44	34.31	27.93
24.5	4	6.13	3	11.38	34.13	28.30
24.75	4	6.19	3	11.31	33.94	28.68
25	4	6.25	3	11.25	33.75	29.05
25.25	4	6.31	3	11.19	33.56	29.43
25.5	4	6.38	3	11.13	33.38	29.81
25.75	4	6.44	3	11.06	33.19	30.20
26	4	6.50	3	11.00	33.00	30.58
26.25	4	6.56	3	10.94	32.81	30.96
26.5	4	6.63	3	10.88	32.63	31.35

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
26.75	4	6.69	3	10.81	32.44	31.74
27	4	6.75	3	10.75	32.25	32.12
27.25	4	6.81	3	10.69	32.06	32.51
27.5	4	6.88	3	10.63	31.88	32.91
27.75	4	6.94	3	10.56	31.69	33.30
28	4	7.00	3	10.50	31.50	33.69
28.25	4	7.06	3	10.44	31.31	34.08
28.5	4	7.13	3	10.38	31.13	34.48
28.75	4	7.19	3	10.31	30.94	34.88
29	4	7.25	3	10.25	30.75	35.27
29.25	4	7.31	3	10.19	30.56	35.67
29.5	4	7.38	3	10.13	30.38	36.07
29.75	4	7.44	3	10.06	30.19	36.47
30	4	7.50	3	10.00	30.00	36.87
30.25	4	7.56	3	9.94	29.81	37.27
30.5	4	7.63	3	9.88	29.63	37.67
30.75	4	7.69	3	9.81	29.44	38.08
31	4	7.75	3	9.75	29.25	38.48
31.25	5	6.25	4	11.25	45.00	29.05
31.5	5	6.30	4	11.20	44.80	29.36
31.75	5	6.35	4	11.15	44.60	29.66
32	5	6.40	4	11.10	44.40	29.97
32.25	5	6.45	4	11.05	44.20	30.27
32.5	5	6.50	4	11.00	44.00	30.58
32.75	5	6.55	4	10.95	43.80	30.89
33	5	6.60	4	10.90	43.60	31.20
33.25	5	6.65	4	10.85	43.40	31.50
33.5	5	6.70	4	10.80	43.20	31.81
33.75	5	6.75	4	10.75	43.00	32.12
34	5	6.80	4	10.70	42.80	32.44
34.25	5	6.85	4	10.65	42.60	32.75
34.5	5	6.90	4	10.60	42.40	33.06
34.75	5	6.95	4	10.55	42.20	33.38
35	5	7.00	4	10.50	42.00	33.69
35.25	5	7.05	4	10.45	41.80	34.01
35.5	5	7.10	4	10.40	41.60	34.32
35.75	5	7.15	4	10.35	41.40	34.64
36	5	7.20	4	10.30	41.20	34.95
36.25	5	7.25	4	10.25	41.00	35.27
36.5	5	7.30	4	10.20	40.80	35.59
36.75	5	7.35	4	10.15	40.60	35.91
37	5	7.40	4	10.10	40.40	36.23
37.25	5	7.45	4	10.05	40.20	36.55

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
37.5	5	7.50	4	10.00	40.00	36.87
37.75	5	7.55	4	9.95	39.80	37.19
38	5	7.60	4	9.90	39.60	37.51
38.25	5	7.65	4	9.85	39.40	37.83
38.5	5	7.70	4	9.80	39.20	38.16
38.75	5	7.75	4	9.75	39.00	38.48
39	6	6.50	5	11.00	55.00	30.58
39.25	6	6.54	5	10.96	54.79	30.84
39.5	6	6.58	5	10.92	54.58	31.09
39.75	6	6.63	5	10.88	54.38	31.35
40	6	6.67	5	10.83	54.17	31.61
40.25	6	6.71	5	10.79	53.96	31.87
40.5	6	6.75	5	10.75	53.75	32.12
40.75	6	6.79	5	10.71	53.54	32.38
41	6	6.83	5	10.67	53.33	32.64
41.25	6	6.88	5	10.63	53.13	32.91
41.5	6	6.92	5	10.58	52.92	33.17
41.75	6	6.96	5	10.54	52.71	33.43
42	6	7.00	5	10.50	52.50	33.69
42.25	6	7.04	5	10.46	52.29	33.95
42.5	6	7.08	5	10.42	52.08	34.22
42.75	6	7.13	5	10.38	51.88	34.48
43	6	7.17	5	10.33	51.67	34.74
43.25	6	7.21	5	10.29	51.46	35.01
43.5	6	7.25	5	10.25	51.25	35.27
43.75	6	7.29	5	10.21	51.04	35.54
44	6	7.33	5	10.17	50.83	35.80
44.25	6	7.38	5	10.13	50.63	36.07
44.5	6	7.42	5	10.08	50.42	36.34
44.75	6	7.46	5	10.04	50.21	36.60
45	6	7.50	5	10.00	50.00	36.87
45.25	6	7.54	5	9.96	49.79	37.14
45.5	6	7.58	5	9.92	49.58	37.41
45.75	6	7.63	5	9.88	49.38	37.67
46	6	7.67	5	9.83	49.17	37.94
46.25	6	7.71	5	9.79	48.96	38.21
46.5	6	7.75	5	9.75	48.75	38.48
46.75	7	6.68	6	10.82	64.93	31.68
47	7	6.71	6	10.79	64.71	31.90
47.25	7	6.75	6	10.75	64.50	32.12
47.5	7	6.79	6	10.71	64.29	32.35
47.75	7	6.82	6	10.68	64.07	32.57
48	7	6.86	6	10.64	63.86	32.79

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
48.25	7	6.89	6	10.61	63.64	33.02
48.5	7	6.93	6	10.57	63.43	33.24
48.75	7	6.96	6	10.54	63.21	33.47
49	7	7.00	6	10.50	63.00	33.69
49.25	7	7.04	6	10.46	62.79	33.92
49.5	7	7.07	6	10.43	62.57	34.14
49.75	7	7.11	6	10.39	62.36	34.37
50	7	7.14	6	10.36	62.14	34.59
5.25	7	0.75	6	16.75	100.50	2.56
50.5	7	7.21	6	10.29	61.71	35.05
50.75	7	7.25	6	10.25	61.50	35.27
51	7	7.29	6	10.21	61.29	35.50
51.25	7	7.32	6	10.18	61.07	35.73
51.5	7	7.36	6	10.14	60.86	35.96
51.75	7	7.39	6	10.11	60.64	36.18
52	7	7.43	6	10.07	60.43	36.41
52.25	7	7.46	6	10.04	60.21	36.64
52.5	7	7.50	6	10.00	60.00	36.87
52.75	7	7.54	6	9.96	59.79	37.10
53	7	7.57	6	9.93	59.57	37.33
53.25	7	7.61	6	9.89	59.36	37.56
53.5	7	7.64	6	9.86	59.14	37.79
53.75	7	7.68	6	9.82	58.93	38.02
54	7	7.71	6	9.79	58.71	38.25
54.25	7	7.75	6	9.75	58.50	38.48
54.5	8	6.81	7	10.69	74.81	32.51
54.75	8	6.84	7	10.66	74.59	32.71
55	8	6.88	7	10.63	74.38	32.91
55.25	8	6.91	7	10.59	74.16	33.10
55.5	8	6.94	7	10.56	73.94	33.30
55.75	8	6.97	7	10.53	73.72	33.49
56	8	7.00	7	10.50	73.50	33.69
56.25	8	7.03	7	10.47	73.28	33.89
56.5	8	7.06	7	10.44	73.06	34.08
56.75	8	7.09	7	10.41	72.84	34.28
57	8	7.13	7	10.38	72.63	34.48
57.25	8	7.16	7	10.34	72.41	34.68
57.5	8	7.19	7	10.31	72.19	34.88
57.75	8	7.22	7	10.28	71.97	35.07
58	8	7.25	7	10.25	71.75	35.27
58.25	8	7.28	7	10.22	71.53	35.47
58.5	8	7.31	7	10.19	71.31	35.67
58.75	8	7.34	7	10.16	71.09	35.87

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
59	8	7.38	7	10.13	70.88	36.07
59.25	8	7.41	7	10.09	70.66	36.27
59.5	8	7.44	7	10.06	70.44	36.47
59.75	8	7.47	7	10.03	70.22	36.67
60	8	7.50	7	10.00	70.00	36.87
60.25	8	7.53	7	9.97	69.78	37.07
60.5	8	7.56	7	9.94	69.56	37.27
60.75	8	7.59	7	9.91	69.34	37.47
61	8	7.63	7	9.88	69.13	37.67
61.25	8	7.66	7	9.84	68.91	37.87
61.5	8	7.69	7	9.81	68.69	38.08
61.75	8	7.72	7	9.78	68.47	38.28
62	8	7.75	7	9.75	68.25	38.48
62.25	9	6.92	8	10.58	84.67	33.17
62.5	9	6.94	8	10.56	84.44	33.34
62.75	9	6.97	8	10.53	84.22	33.52
63	9	7.00	8	10.50	84.00	33.69
63.25	9	7.03	8	10.47	83.78	33.87
63.5	9	7.06	8	10.44	83.56	34.04
63.75	9	7.08	8	10.42	83.33	34.22
64	9	7.11	8	10.39	83.11	34.39
64.25	9	7.14	8	10.36	82.89	34.57
64.5	9	7.17	8	10.33	82.67	34.74
64.75	9	7.19	8	10.31	82.44	34.92
65	9	7.22	8	10.28	82.22	35.10
65.25	9	7.25	8	10.25	82.00	35.27
65.5	9	7.28	8	10.22	81.78	35.45
65.75	9	7.31	8	10.19	81.56	35.63
66	9	7.33	8	10.17	81.33	35.80
66.25	9	7.36	8	10.14	81.11	35.98
66.5	9	7.39	8	10.11	80.89	36.16
66.75	9	7.42	8	10.08	80.67	36.34
67	9	7.44	8	10.06	80.44	36.51
67.25	9	7.47	8	10.03	80.22	36.69
67.5	9	7.50	8	10.00	80.00	36.87
67.75	9	7.53	8	9.97	79.78	37.05
68	9	7.56	8	9.94	79.56	37.23
68.25	9	7.58	8	9.92	79.33	37.41
68.5	9	7.61	8	9.89	79.11	37.58
68.75	9	7.64	8	9.86	78.89	37.76
69	10	6.90	9	10.60	95.40	33.06
69.25	10	6.93	9	10.58	95.18	33.22
69.5	10	6.95	9	10.55	94.95	33.38

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
69.75	10	6.98	9	10.53	94.73	33.53
70	10	7.00	9	10.50	94.50	33.69
70.25	10	7.03	9	10.48	94.28	33.85
70.5	10	7.05	9	10.45	94.05	34.01
70.75	10	7.08	9	10.43	93.83	34.16
71	10	7.10	9	10.40	93.60	34.32
71.25	10	7.13	9	10.38	93.38	34.48
71.5	10	7.15	9	10.35	93.15	34.64
71.75	10	7.18	9	10.33	92.93	34.80
72	10	7.20	9	10.30	92.70	34.95
72.25	10	7.23	9	10.28	92.48	35.11
72.5	10	7.25	9	10.25	92.25	35.27
72.75	10	7.28	9	10.23	92.03	35.43
73	10	7.30	9	10.20	91.80	35.59
73.25	10	7.33	9	10.18	91.58	35.75
73.5	10	7.35	9	10.15	91.35	35.91
73.75	10	7.38	9	10.13	91.13	36.07
74	10	7.40	9	10.10	90.90	36.23
74.25	10	7.43	9	10.08	90.68	36.39
74.5	10	7.45	9	10.05	90.45	36.55
74.75	10	7.48	9	10.03	90.23	36.71
75	10	7.50	9	10.00	90.00	36.87
75.25	10	7.53	9	9.98	89.78	37.03
75.5	10	7.55	9	9.95	89.55	37.19
75.75	10	7.58	9	9.93	89.33	37.35
76	10	7.60	9	9.90	89.10	37.51
76.25	10	7.63	9	9.88	88.88	37.67
76.5	11	6.95	10	10.55	105.45	33.40
76.75	11	6.98	10	10.52	105.23	33.55
77	11	7.00	10	10.50	105.00	33.69
77.25	11	7.02	10	10.48	104.77	33.83
77.5	11	7.05	10	10.45	104.55	33.98
77.75	11	7.07	10	10.43	104.32	34.12
78	11	7.09	10	10.41	104.09	34.26
78.25	11	7.11	10	10.39	103.86	34.41
78.5	11	7.14	10	10.36	103.64	34.55
78.75	11	7.16	10	10.34	103.41	34.70
79	11	7.18	10	10.32	103.18	34.84
79.25	11	7.20	10	10.30	102.95	34.98
79.5	11	7.23	10	10.27	102.73	35.13
79.75	11	7.25	10	10.25	102.50	35.27
80	11	7.27	10	10.23	102.27	35.42
80.25	11	7.30	10	10.20	102.05	35.56

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
80.5	11	7.32	10	10.18	101.82	35.71
80.75	11	7.34	10	10.16	101.59	35.85
81	11	7.36	10	10.14	101.36	36.00
81.25	11	7.39	10	10.11	101.14	36.14
81.5	11	7.41	10	10.09	100.91	36.29
81.75	11	7.43	10	10.07	100.68	36.43
82	11	7.45	10	10.05	100.45	36.58
82.25	11	7.48	10	10.02	100.23	36.72
82.5	11	7.50	10	10.00	100.00	36.87
82.75	11	7.52	10	9.98	99.77	37.02
83	11	7.55	10	9.95	99.55	37.16
83.25	11	7.57	10	9.93	99.32	37.31
83.5	11	7.59	10	9.91	99.09	37.45
83.75	11	7.61	10	9.89	98.86	37.60
84	11	7.64	10	9.86	98.64	37.75
84.25	12	7.02	11	10.48	115.27	33.82
84.5	12	7.04	11	10.46	115.04	33.95
84.75	12	7.06	11	10.44	114.81	34.08
85	12	7.08	11	10.42	114.58	34.22
85.25	12	7.10	11	10.40	114.35	34.35
85.5	12	7.13	11	10.38	114.13	34.48
85.75	12	7.15	11	10.35	113.90	34.61
86	12	7.17	11	10.33	113.67	34.74
86.25	12	7.19	11	10.31	113.44	34.88
86.5	12	7.21	11	10.29	113.21	35.01
86.75	12	7.23	11	10.27	112.98	35.14
87	12	7.25	11	10.25	112.75	35.27
87.25	12	7.27	11	10.23	112.52	35.40
87.5	12	7.29	11	10.21	112.29	35.54
87.75	12	7.31	11	10.19	112.06	35.67
88	12	7.33	11	10.17	111.83	35.80
88.25	12	7.35	11	10.15	111.60	35.94
88.5	12	7.38	11	10.13	111.38	36.07
88.75	12	7.40	11	10.10	111.15	36.20
89	12	7.42	11	10.08	110.92	36.34
89.25	12	7.44	11	10.06	110.69	36.47
89.5	12	7.46	11	10.04	110.46	36.60
89.75	12	7.48	11	10.02	110.23	36.74
90	12	7.50	11	10.00	110.00	36.87
90.25	12	7.52	11	9.98	109.77	37.00
90.5	12	7.54	11	9.96	109.54	37.14
90.75	12	7.56	11	9.94	109.31	37.27
91	12	7.58	11	9.92	109.08	37.41

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
91.25	13	7.02	12	10.48	125.77	33.81
91.5	13	7.04	12	10.46	125.54	33.93
91.75	13	7.06	12	10.44	125.31	34.05
92	13	7.08	12	10.42	125.08	34.18
92.25	13	7.10	12	10.40	124.85	34.30
92.5	13	7.12	12	10.38	124.62	34.42
92.75	13	7.13	12	10.37	124.38	34.54
93	13	7.15	12	10.35	124.15	34.66
93.25	13	7.17	12	10.33	123.92	34.78
93.5	13	7.19	12	10.31	123.69	34.91
93.75	13	7.21	12	10.29	123.46	35.03
94	13	7.23	12	10.27	123.23	35.15
94.25	13	7.25	12	10.25	123.00	35.27
94.5	13	7.27	12	10.23	122.77	35.39
94.75	13	7.29	12	10.21	122.54	35.52
95	13	7.31	12	10.19	122.31	35.64
95.25	13	7.33	12	10.17	122.08	35.76
95.5	13	7.35	12	10.15	121.85	35.89
95.75	13	7.37	12	10.13	121.62	36.01
96	13	7.38	12	10.12	121.38	36.13
96.25	13	7.40	12	10.10	121.15	36.25
96.5	13	7.42	12	10.08	120.92	36.38
96.75	13	7.44	12	10.06	120.69	36.50
97	13	7.46	12	10.04	120.46	36.62
97.25	13	7.48	12	10.02	120.23	36.75
97.5	13	7.50	12	10.00	120.00	36.87
97.75	13	7.52	12	9.98	119.77	36.99
98	14	7.00	13	10.50	136.50	33.69
98.25	14	7.02	13	10.48	136.27	33.80
98.5	14	7.04	13	10.46	136.04	33.92
98.75	14	7.05	13	10.45	135.80	34.03
99	14	7.07	13	10.43	135.57	34.14
99.25	14	7.09	13	10.41	135.34	34.25
99.5	14	7.11	13	10.39	135.11	34.37
99.75	14	7.13	13	10.38	134.88	34.48
100	14	7.14	13	10.36	134.64	34.59
100.25	14	7.16	13	10.34	134.41	34.71
100.5	14	7.18	13	10.32	134.18	34.82
100.75	14	7.20	13	10.30	133.95	34.93
101	14	7.21	13	10.29	133.71	35.05
101.25	14	7.23	13	10.27	133.48	35.16
101.5	14	7.25	13	10.25	133.25	35.27
101.75	14	7.27	13	10.23	133.02	35.39

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
102	14	7.29	13	10.21	132.79	35.50
102.25	14	7.30	13	10.20	132.55	35.61
102.5	14	7.32	13	10.18	132.32	35.73
102.75	14	7.34	13	10.16	132.09	35.84
103	14	7.36	13	10.14	131.86	35.96
103.25	14	7.38	13	10.13	131.63	36.07
103.5	14	7.39	13	10.11	131.39	36.18
103.75	14	7.41	13	10.09	131.16	36.30
104	14	7.43	13	10.07	130.93	36.41
104.25	14	7.45	13	10.05	130.70	36.53
104.5	14	7.46	13	10.04	130.46	36.64
104.75	14	7.48	13	10.02	130.23	36.76
105	14	7.50	13	10.00	130.00	36.87
105.25	15	7.02	14	10.48	146.77	33.80
105.5	15	7.03	14	10.47	146.53	33.90
105.75	15	7.05	14	10.45	146.30	34.01
106	15	7.07	14	10.43	146.07	34.11
106.25	15	7.08	14	10.42	145.83	34.22
106.5	15	7.10	14	10.40	145.60	34.32
106.75	15	7.12	14	10.38	145.37	34.43
107	15	7.13	14	10.37	145.13	34.53
107.25	15	7.15	14	10.35	144.90	34.64
107.5	15	7.17	14	10.33	144.67	34.74
107.75	15	7.18	14	10.32	144.43	34.85
108	15	7.20	14	10.30	144.20	34.95
108.25	15	7.22	14	10.28	143.97	35.06
108.5	15	7.23	14	10.27	143.73	35.17
108.75	15	7.25	14	10.25	143.50	35.27
109	15	7.27	14	10.23	143.27	35.38
109.25	15	7.28	14	10.22	143.03	35.48
109.5	15	7.30	14	10.20	142.80	35.59
109.75	15	7.32	14	10.18	142.57	35.70
110	15	7.33	14	10.17	142.33	35.80
110.25	15	7.35	14	10.15	142.10	35.91
110.5	15	7.37	14	10.13	141.87	36.02
110.75	15	7.38	14	10.12	141.63	36.12
111	15	7.40	14	10.10	141.40	36.23
111.25	15	7.42	14	10.08	141.17	36.34
111.5	15	7.43	14	10.07	140.93	36.44
111.75	15	7.45	14	10.05	140.70	36.55
112	15	7.47	14	10.03	140.47	36.66
112.25	15	7.48	14	10.02	140.23	36.76
112.5	15	7.50	14	10.00	140.00	36.87

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
112.75	16	7.05	15	10.45	156.80	33.99
113	16	7.06	15	10.44	156.56	34.08
113.25	16	7.08	15	10.42	156.33	34.18
113.5	16	7.09	15	10.41	156.09	34.28
113.75	16	7.11	15	10.39	155.86	34.38
114	16	7.13	15	10.38	155.63	34.48
114.25	16	7.14	15	10.36	155.39	34.58
114.5	16	7.16	15	10.34	155.16	34.68
114.75	16	7.17	15	10.33	154.92	34.78
115	16	7.19	15	10.31	154.69	34.88
115.25	16	7.20	15	10.30	154.45	34.97
115.5	16	7.22	15	10.28	154.22	35.07
115.75	16	7.23	15	10.27	153.98	35.17
116	16	7.25	15	10.25	153.75	35.27
116.25	16	7.27	15	10.23	153.52	35.37
116.5	16	7.28	15	10.22	153.28	35.47
116.75	16	7.30	15	10.20	153.05	35.57
117	16	7.31	15	10.19	152.81	35.67
117.25	16	7.33	15	10.17	152.58	35.77
117.5	16	7.34	15	10.16	152.34	35.87
117.75	16	7.36	15	10.14	152.11	35.97
118	16	7.38	15	10.13	151.88	36.07
118.25	16	7.39	15	10.11	151.64	36.17
118.5	16	7.41	15	10.09	151.41	36.27
118.75	16	7.42	15	10.08	151.17	36.37
119	16	7.44	15	10.06	150.94	36.47
119.25	16	7.45	15	10.05	150.70	36.57
119.5	16	7.47	15	10.03	150.47	36.67
119.75	16	7.48	15	10.02	150.23	36.77
120	16	7.50	15	10.00	150.00	36.87
120.25	17	7.07	16	10.43	166.82	34.15
120.5	17	7.09	16	10.41	166.59	34.25
120.75	17	7.10	16	10.40	166.35	34.34
121	17	7.12	16	10.38	166.12	34.43
121.25	17	7.13	16	10.37	165.88	34.53
121.5	17	7.15	16	10.35	165.65	34.62
121.75	17	7.16	16	10.34	165.41	34.71
122	17	7.18	16	10.32	165.18	34.81
122.25	17	7.19	16	10.31	164.94	34.90
122.5	17	7.21	16	10.29	164.71	34.99
122.75	17	7.22	16	10.28	164.47	35.09
123	17	7.24	16	10.26	164.24	35.18
123.25	17	7.25	16	10.25	164.00	35.27

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
123.5	17	7.26	16	10.24	163.76	35.37
123.75	17	7.28	16	10.22	163.53	35.46
124	17	7.29	16	10.21	163.29	35.55
124.25	17	7.31	16	10.19	163.06	35.65
124.5	17	7.32	16	10.18	162.82	35.74
124.75	17	7.34	16	10.16	162.59	35.83
125	17	7.35	16	10.15	162.35	35.93
125.25	17	7.37	16	10.13	162.12	36.02
125.5	17	7.38	16	10.12	161.88	36.12
125.75	17	7.40	16	10.10	161.65	36.21
126	17	7.41	16	10.09	161.41	36.30
126.25	17	7.43	16	10.07	161.18	36.40
126.5	17	7.44	16	10.06	160.94	36.49
126.75	17	7.46	16	10.04	160.71	36.59
127	17	7.47	16	10.03	160.47	36.68
127.25	17	7.49	16	10.01	160.24	36.78
127.5	17	7.50	16	10.00	160.00	36.87
127.75	18	7.10	17	10.40	176.85	34.30
128	18	7.11	17	10.39	176.61	34.39
128.25	18	7.13	17	10.38	176.38	34.48
128.5	18	7.14	17	10.36	176.14	34.57
128.75	18	7.15	17	10.35	175.90	34.66
129	18	7.17	17	10.33	175.67	34.74
129.25	18	7.18	17	10.32	175.43	34.83
129.5	18	7.19	17	10.31	175.19	34.92
129.75	18	7.21	17	10.29	174.96	35.01
130	18	7.22	17	10.28	174.72	35.10
130.25	18	7.24	17	10.26	174.49	35.18
130.5	18	7.25	17	10.25	174.25	35.27
130.75	18	7.26	17	10.24	174.01	35.36
131	18	7.28	17	10.22	173.78	35.45
131.25	18	7.29	17	10.21	173.54	35.54
131.5	18	7.31	17	10.19	173.31	35.63
131.75	18	7.32	17	10.18	173.07	35.71
132	18	7.33	17	10.17	172.83	35.80
132.25	18	7.35	17	10.15	172.60	35.89
132.5	18	7.36	17	10.14	172.36	35.98
132.75	18	7.38	17	10.13	172.13	36.07
133	18	7.39	17	10.11	171.89	36.16
133.25	18	7.40	17	10.10	171.65	36.25
133.5	18	7.42	17	10.08	171.42	36.34
133.75	18	7.43	17	10.07	171.18	36.42
134	18	7.44	17	10.06	170.94	36.51

Total Rise	Risers	Riser Height	Steps	Tread	Total Run	Angle
134.25	18	7.46	17	10.04	170.71	36.60
134.5	18	7.47	17	10.03	170.47	36.69
134.75	18	7.49	17	10.01	170.24	36.78
135	18	7.50	17	10.00	170.00	36.87
135.25	19	7.12	18	10.38	186.87	34.44
135.5	19	7.13	18	10.37	186.63	34.52
135.75	19	7.14	18	10.36	186.39	34.60
135	19	7.11	18	10.39	187.11	34.35
135.25	19	7.12	18	10.38	186.87	34.44
135.5	19	7.13	18	10.37	186.63	34.52
135.75	19	7.14	18	10.36	186.39	34.60
136	19	7.16	18	10.34	186.16	34.69
136.25	19	7.17	18	10.33	185.92	34.77
136.5	19	7.18	18	10.32	185.68	34.85
136.75	19	7.20	18	10.30	185.45	34.94
137	19	7.21	18	10.29	185.21	35.02
137.25	19	7.22	18	10.28	184.97	35.11
137.5	19	7.24	18	10.26	184.74	35.19
137.75	19	7.25	18	10.25	184.50	35.27
138	19	7.26	18	10.24	184.26	35.36
138.25	19	7.28	18	10.22	184.03	35.44
138.5	19	7.29	18	10.21	183.79	35.52
138.75	19	7.30	18	10.20	183.55	35.61
139	19	7.32	18	10.18	183.32	35.69
139.25	19	7.33	18	10.17	183.08	35.78
139.5	19	7.34	18	10.16	182.84	35.86
139.75	19	7.36	18	10.14	182.61	35.94
140	19	7.37	18	10.13	182.37	36.03

Decimals To Inches Chart

Decimal	Fraction
.0625	One sixteenth of an inch or 1/16”
.125	One eight of an inch or 1/8”
.1875	Three sixteenths of an inch or 3/16”
.25	One quarter inch or 1/4”
.3125	Five sixteenths of and inch or 5/16”
.375	Three eights of an inch or 3/8”
.4375	Seven sixteenths of an inch or 7/16”
.5	One half inch or 1/2”
.5625	Nine sixteenths of an inch or 9/16”
.625	Five eights of an inch or 5/8”
.6875	Eleven sixteenths of an inch or 11/16”
.75	Three quarters of an inch or 3/4”
.8125	Thirteen sixteenths of an inch or 13/16”
.875	Seven eights of an inch or 7/8”
.9375	Fifteen sixteenths of an inch or 15/16”
1.0	One inch or 1”

One slash represents a foot (‘)or 12’ translates into twelve feet.

Two slashes or quotation marks represent inches (“) or 14” translates into fourteen inches.

These marks are usually used by architects and designers and can be found on building blueprints.