

Chapter 4

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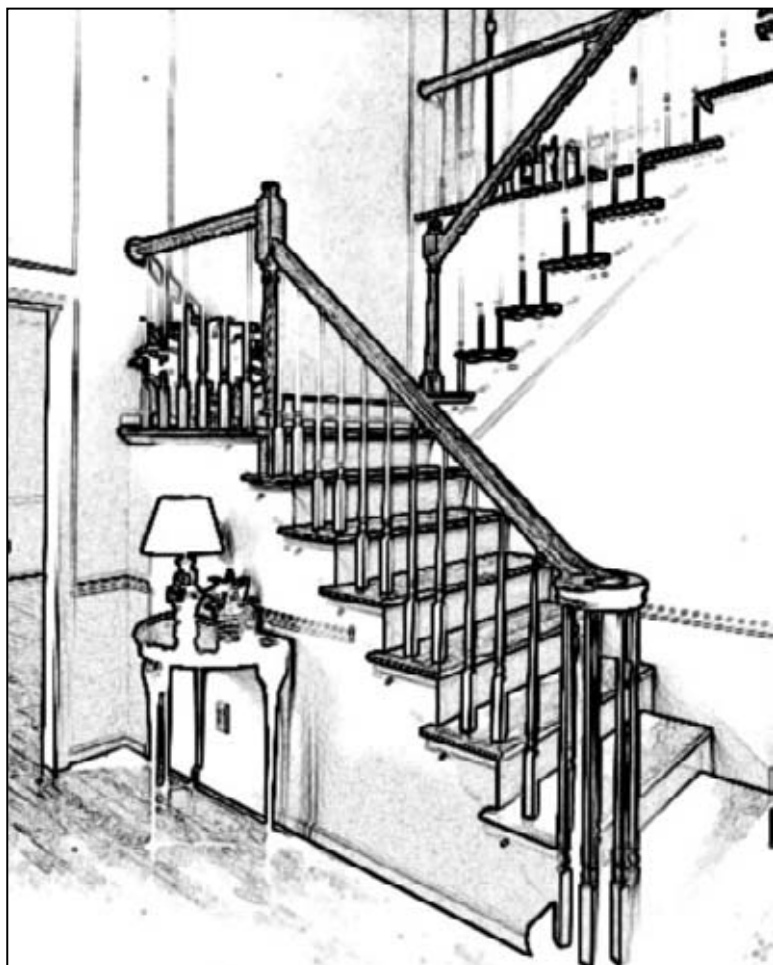
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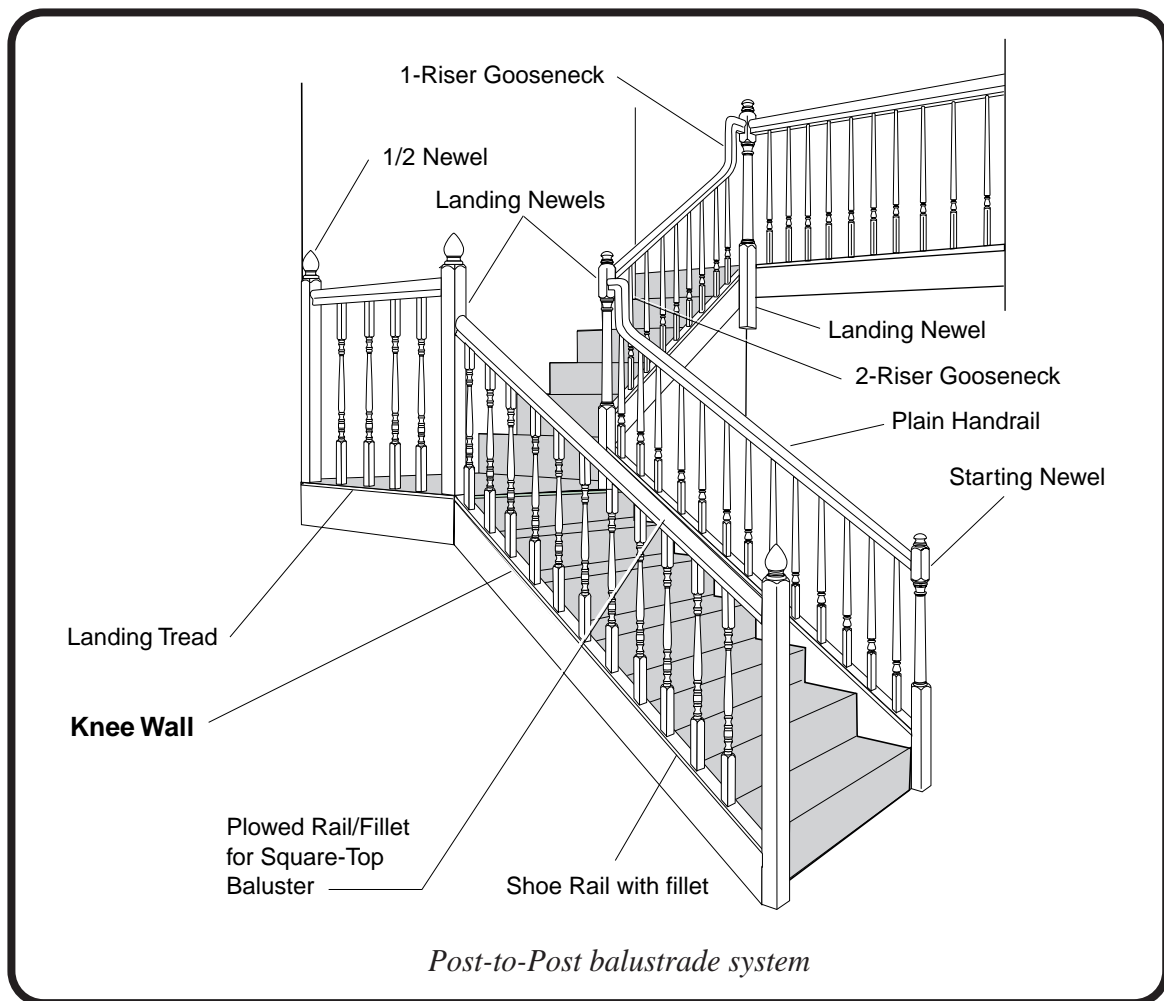
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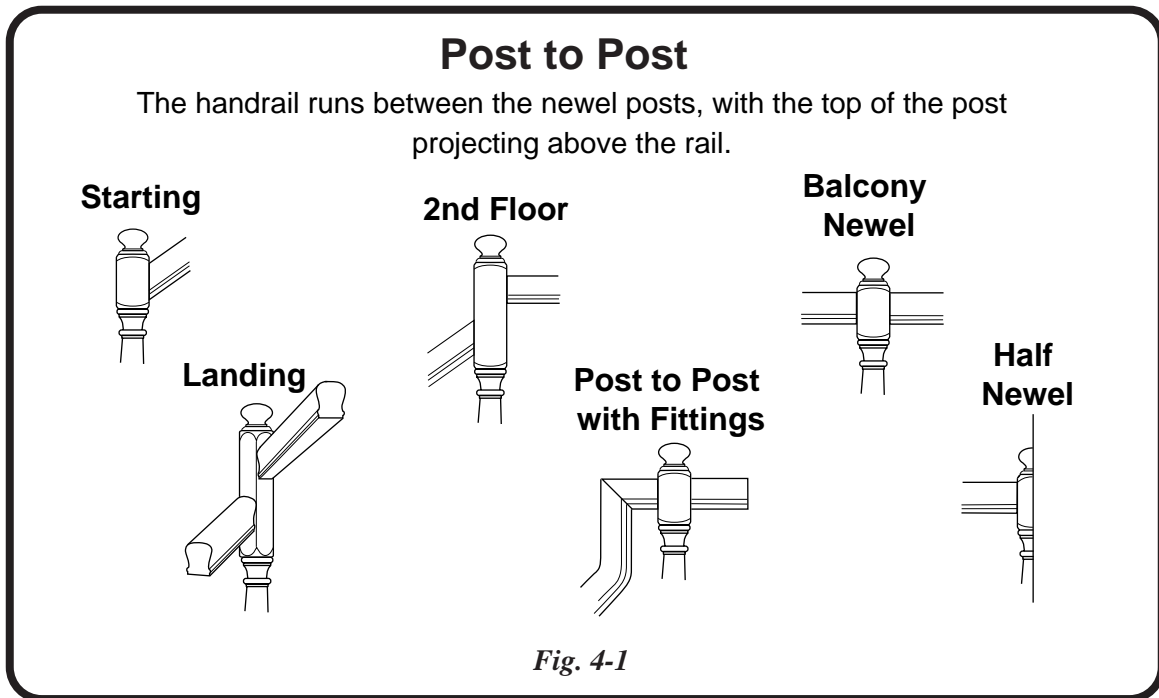
The Post-to-Post Balustrade System

Post-to-post stair systems are designed with rail running between a series of newels.



There are two types of post-to-post systems: the standard post-to-post and the post-to-post with fittings. This balustrade system is used on both the straight stair and the L-shaped stair.

In a post-to-post connection without fittings, the upper square section on the starting newel is shorter than the upper square section on the landing newel, which is longer to accommodate the change in rise between the first run and the second run of the staircase. Please note Fig. 4-1 here.



A variation of the post-to-post balustrade is the post-to-post balustrade with fittings. This design provides a more elegant look and is more versatile than the standard post-to-post system. The stair builder is not confined by the length of the top square of the newels and can use the newels in a greater variety of locations.

This chapter explains how to install newel posts and then how to complete the rails for a standard post-to-post system and for a post-to-post system with fittings.

Standard Post-to-Post (No Fittings)

Installing the Starting Newel

Newels are solid posts that provide the major support for the balustrade. The two types of newels used with the post-to-post without fittings are starting newels and landing newels. Starting newels are located at the bottom of the staircase, hence the name “starting” newels.

The following steps describe the process:

1. After determining the centerline for the rail system (see Chapter 3), draw a square on the tread where the starting newel will be placed. There are no guidelines for the placement of the newel, but it is typically mounted on the face of the first riser. If necessary, notch the nosing of the tread to allow the newel to sit tightly against the frame of the staircase. Please note Fig. 4-2 here.

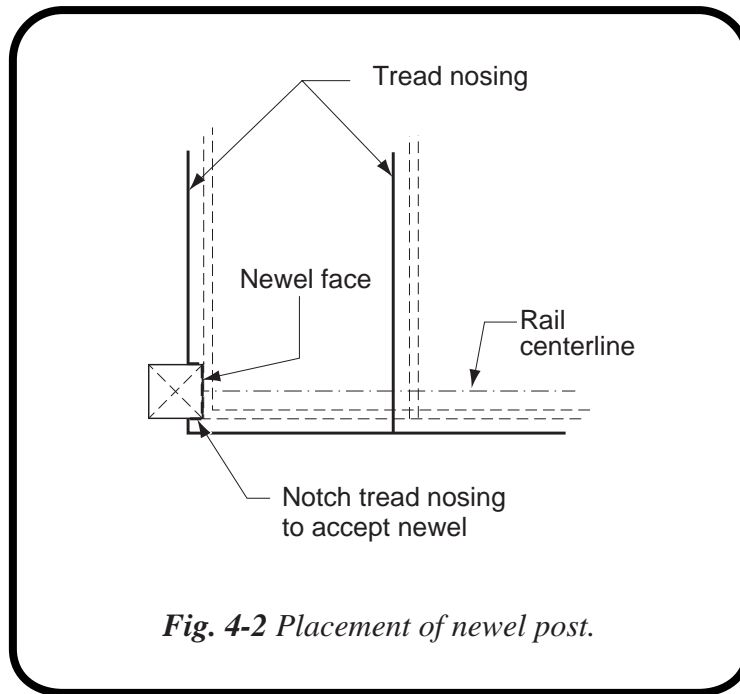


Fig. 4-2 Placement of newel post.

- Next, find the slope difference or the distance the rail climbs from the nose of the tread to the back of the newel. Lay a straight edge on the treads. On the line where the back of the newel will sit, measure the distance between the tread and the straight edge. Please note Fig. 4-3 here.

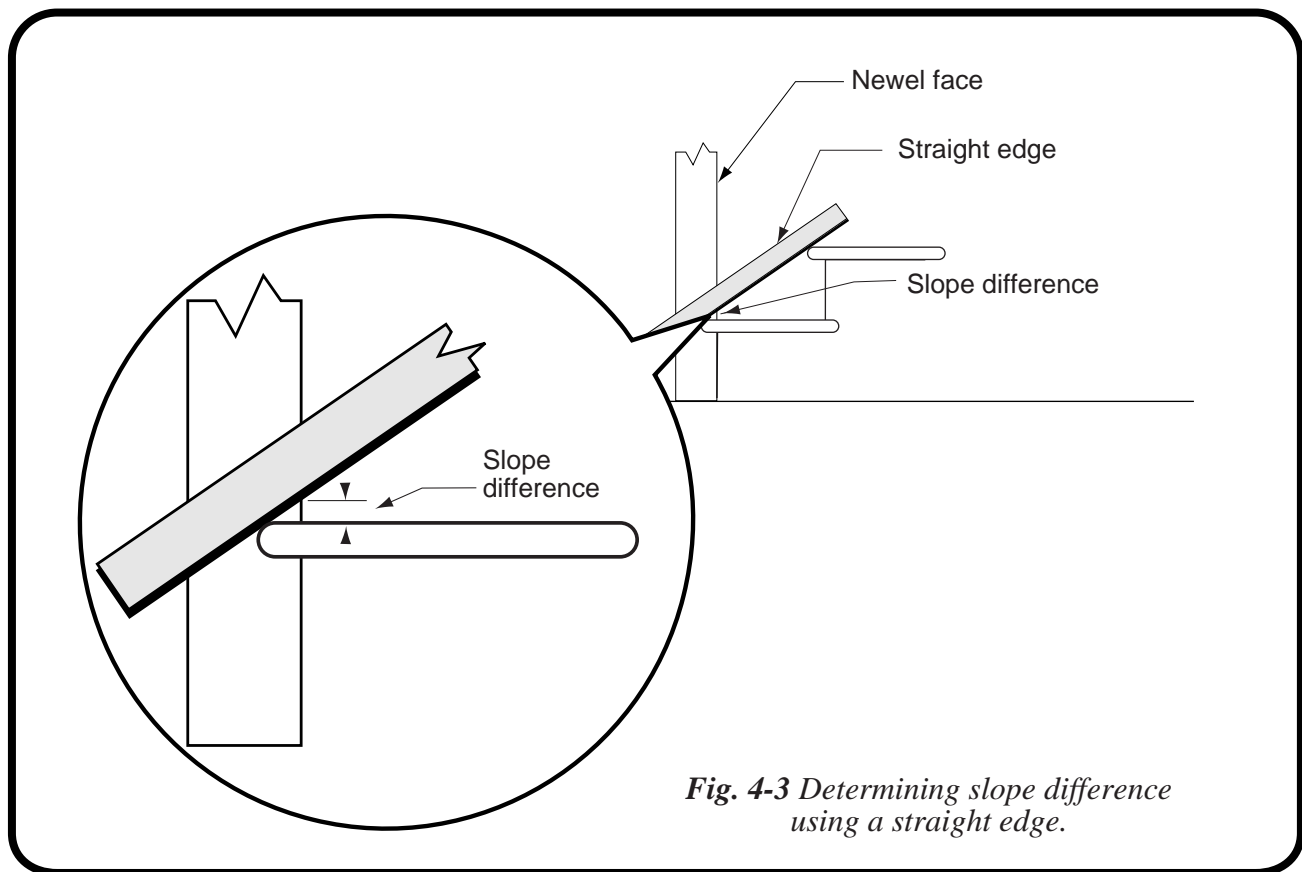
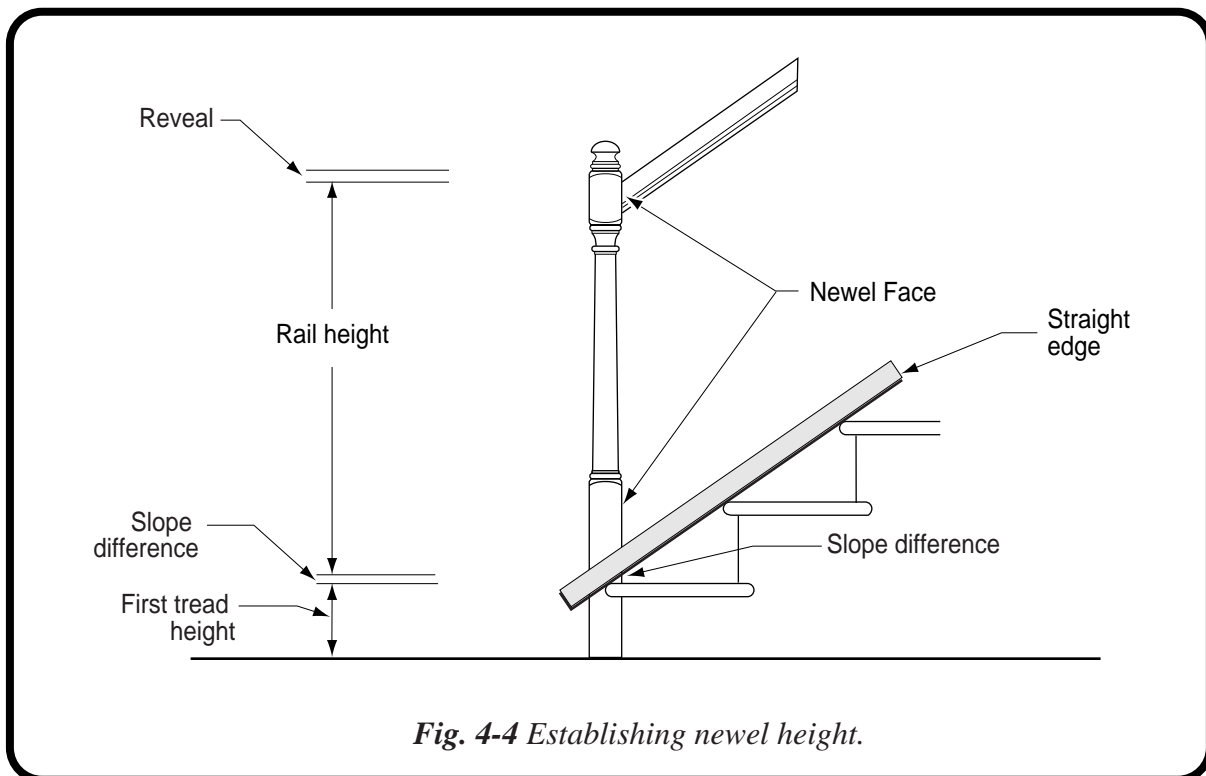


Fig. 4-3 Determining slope difference using a straight edge.

3. To determine the newel length, add the reveal (the distance from the top of the newel square to the top of the rail), the desired rail height (usually between 34 and 38-inches, refer to local building codes), the slope difference, and the riser height. Please note Fig. 4-4 here.

Starting Newel Height

$$\begin{array}{r}
 \text{—————} \quad \text{Distance from the bottom of the fitting to the tread} \\
 + \text{—————} \quad \text{Desired rail height} \\
 - \text{—————} \quad \text{Depth of the handrail} \\
 \hline
 \text{—————} \quad = \text{Starting newel height}
 \end{array}$$



4. Cut the newel off with a miter saw and notch. (If required)
- 5 Make sure that the newel is plumb. Bolt and glue the newel to the staircase frame.

Caution: It is critical that the newel is attached securely in order for staircase to comply with local building codes.

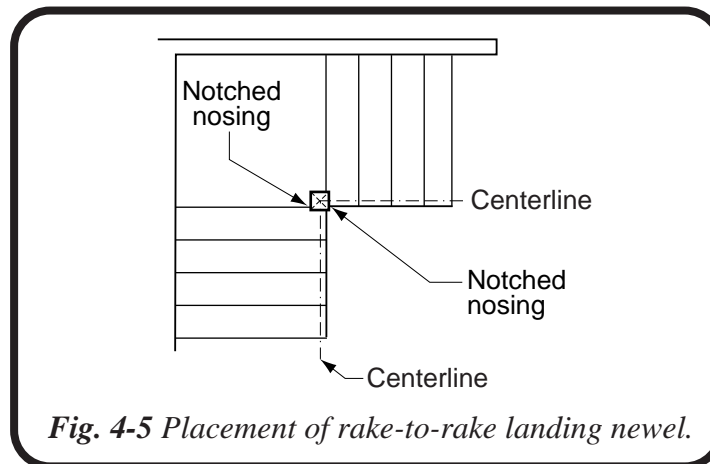
***Note:** Do not include decoration (finial) above top square of the newel post when determining newel length.

Installing a Rake-to-Rake Landing Newel

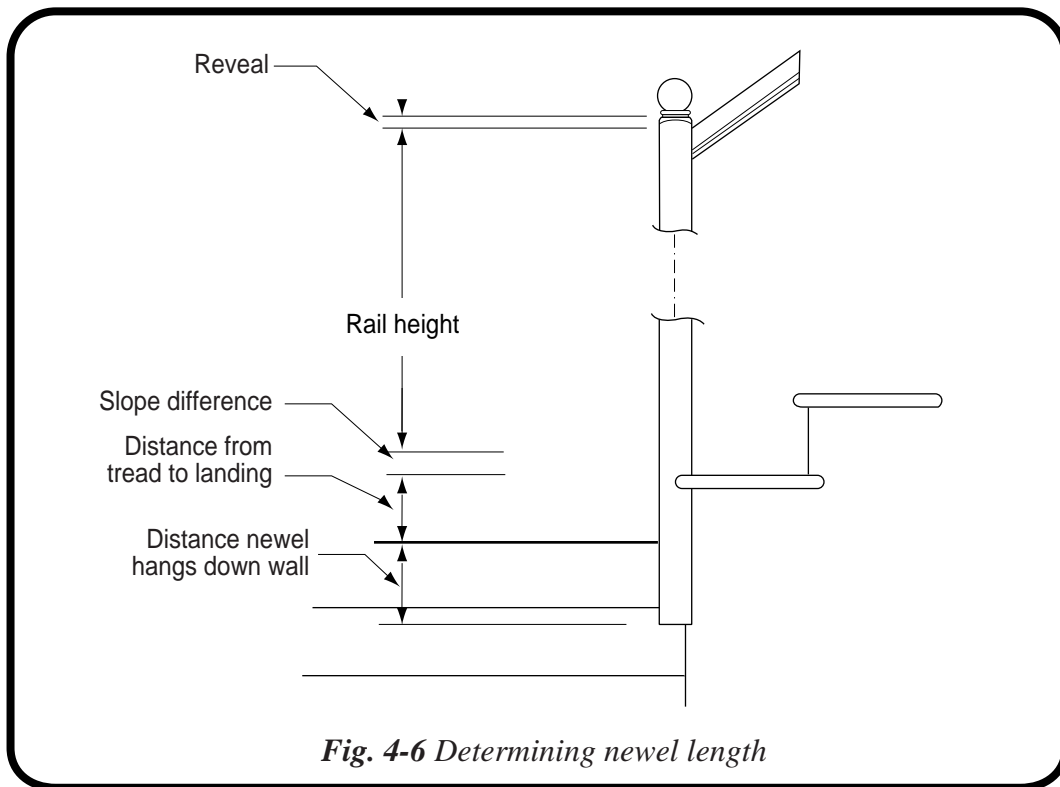
A rake-to-rake landing newel or transitional newel connects the upper and lower railing system on an L-shaped stair. Before starting this process, make sure you have a landing or transitional newel, which has a top square length of at least 13-inches.

The following steps describe the process:

1. Draw a square the size of the newel at the intersecting point of the upper and lower centerlines of rake rails. The center of the square must be the same as the centerline intersecting point. Please note Fig. 4-5 here.



2. If necessary, notch the nosing of the tread and landing to allow the newel to sit tightly against the frame of the staircase.
3. Lay a straight edge on the upper rake and determine the slope difference, just as you did with the starting newel.
4. To determine the newel length, add the reveal, the rail height, the slope difference, and the riser height. Please note Fig. 4-6 here.



If the newel is to lap down the wall, also known as a half-lap installation, add the distance you wish to run the newel down the wall.

Rake-to-Rake Newel Length

$$\begin{array}{r}
 \text{_____} \quad \text{Reveal} \\
 \text{_____} \quad + \text{ Rail Height} \\
 \text{_____} \quad + \text{ Slope difference} \\
 \text{_____} \quad + \text{ Tread height} \\
 \hline
 \text{_____} \quad = \text{ Rake-to-rake newel length (TOP MOUNT SYSTEM)} \\
 \text{_____} \quad + \text{ Tale or drop down length} \\
 \hline
 \text{_____} \quad \text{Rake-to-rake newel length (HALF LAP SYSTEM)}
 \end{array}$$

5. Cut the newel off with a miter saw and make any necessary notches.
6. Make sure that the newel is plumb. Bolt and glue newel to the staircase frame.

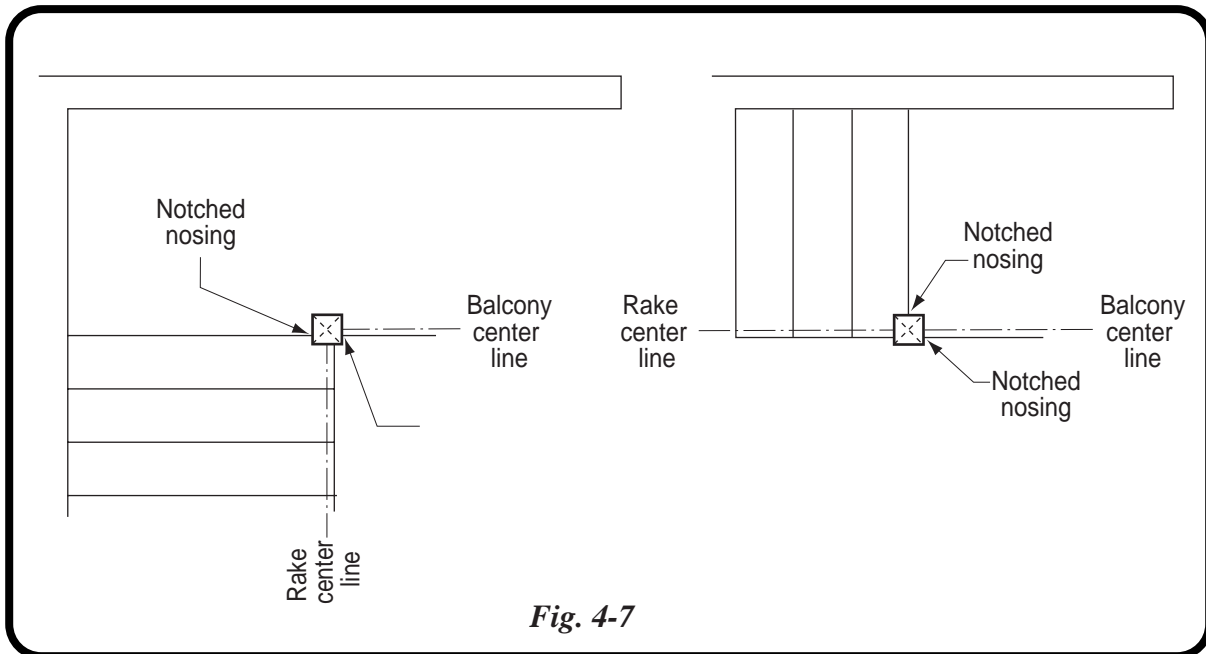
Caution: It is critical that the newel is attached securely in order for the staircase to comply with local building codes.

Note: Do not include the decoration above the top square when determining newel length.

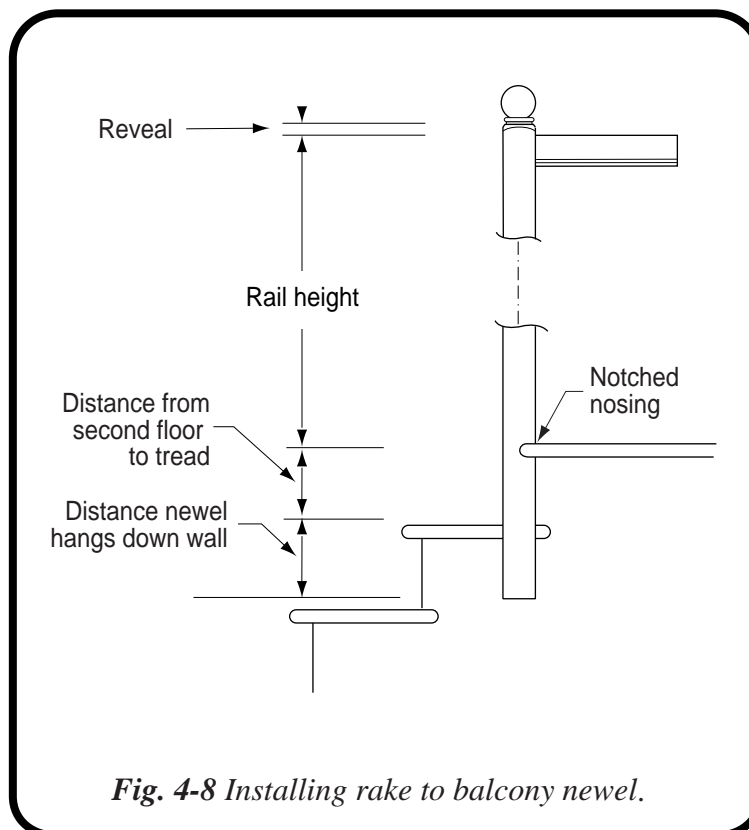
Installing a Rake-to-Balcony Newel

The rake-to-balcony newel is used to support the rake rail and balcony rail as it makes the turn onto the balcony. A rake-to-balcony newel usually has a top square length of at least 10-inches.

1. Draw a square at the intersecting point of the rake rail centerline and the balcony rail centerline. Remember the center of the square must be the same as the intersecting point. Please note Fig. 4-7 here.

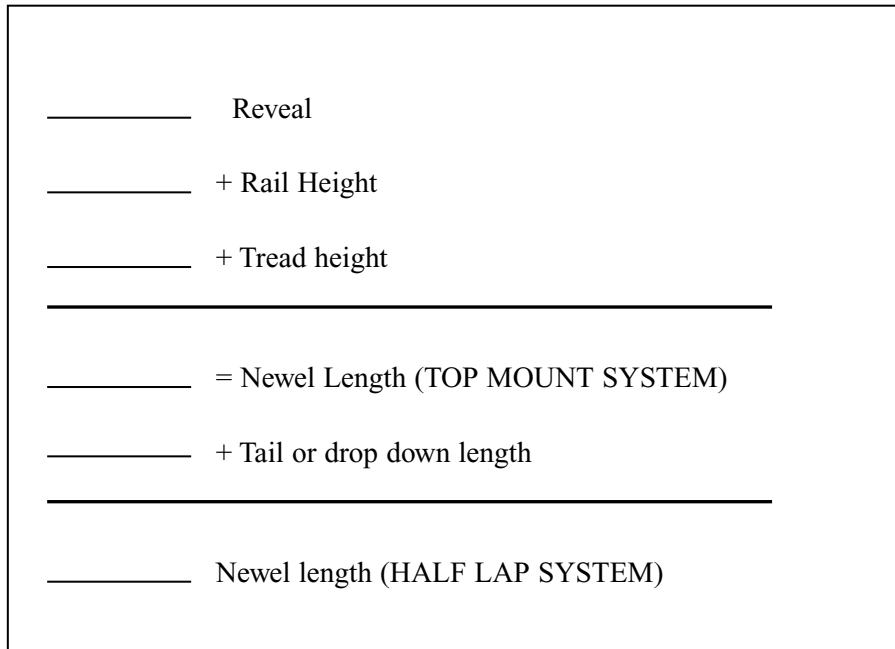


2. If necessary, notch the nosing of the tread and landing tread to allow the newel to sit tightly against the frame of the staircase.



- To determine the newel length, add the reveal, the desired balcony height (usually a minimum of 36-inches; refer to local building codes) and the distance from the second floor to the top of the tread (unless the newel is sitting entirely on the second floor). If the newel is to half lap down the wall, also add the distance you wish to run the newel down the wall. Please note Fig. 4-8 here.

Rake-to-Balcony Newel Length



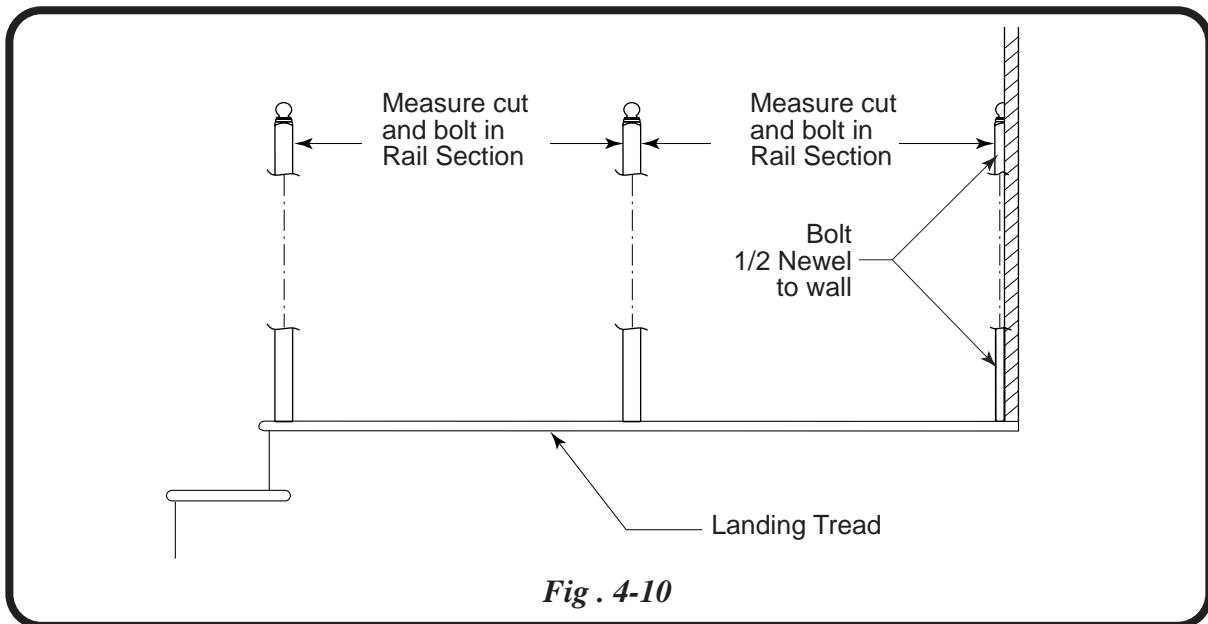
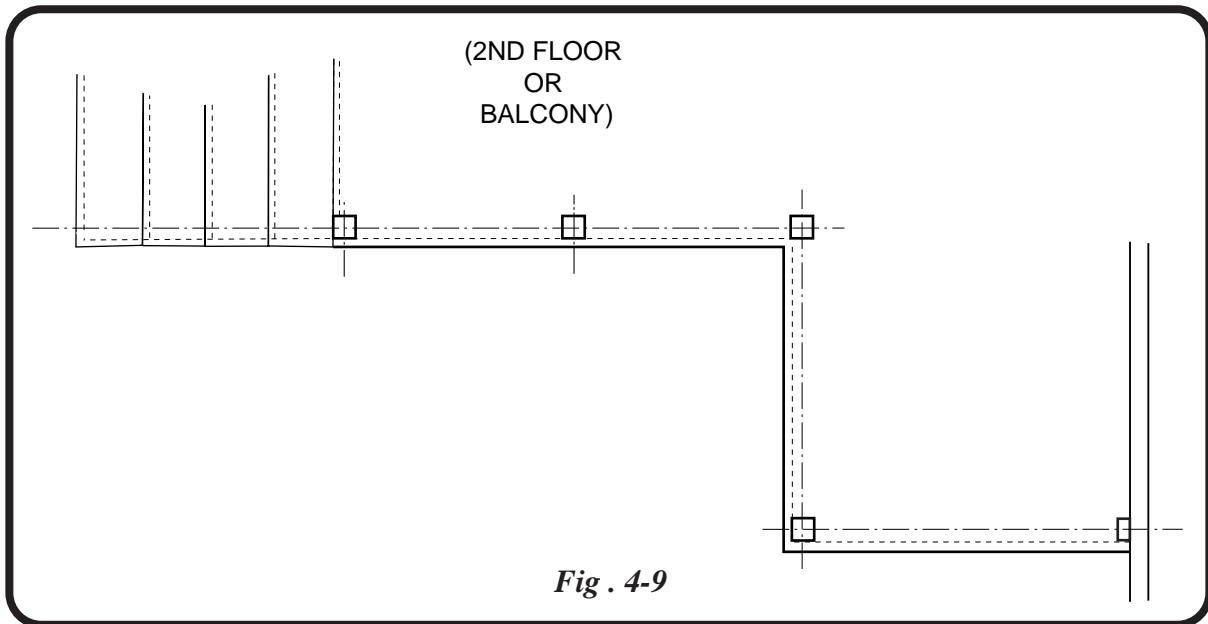
- Cut the newel off with a miter saw and make any necessary notches.
- Make sure that the newel is plumb. Bolt and glue the newel post to the staircase frame.

Caution: *It is critical that the newel is attached securely for the staircase to comply with local building codes.*

Installing Post-to-Post Balcony Rail Sections

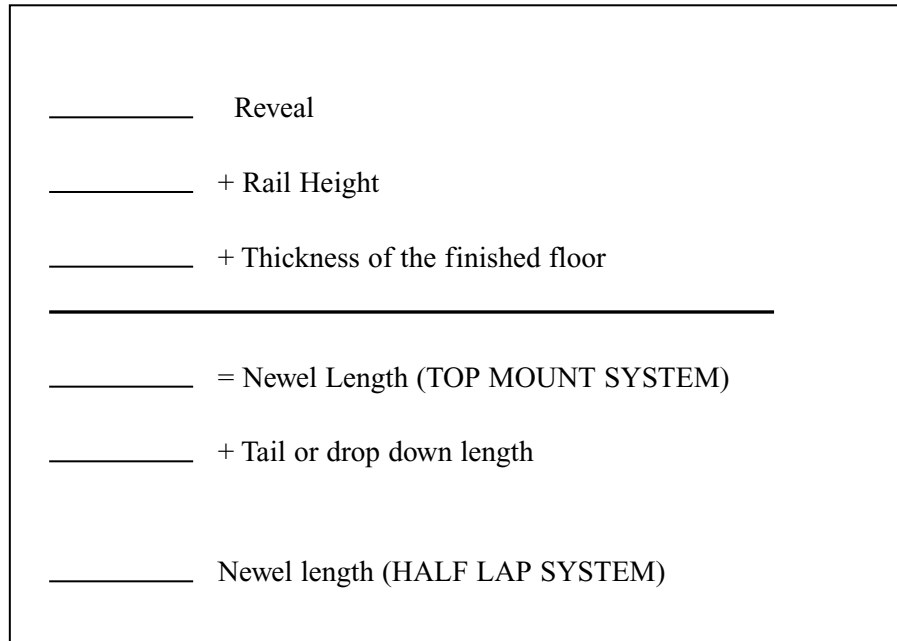
- Transition newel installation between rake rail and balcony rail can be found in the L-shaped stair section.
- Draw rail centerline on floor on the balcony area.
- Draw newel layout at all intersecting points. In this case, it is critical that the rail centerline matches up with the center of the newel sides.

4. Straight rail sections may be divided into smaller sections with the use of an extra newel. This is usually done either for structural reasons or aesthetics, or to achieve balance and symmetry in the system. Please note Fig. 4-9 here.



5. Once you have completed your layout, you must determine the newel length.
6. The newel length is determined by adding the desired rail height plus the thickness of the finished floor plus the reveal from the top square to the top of the rail. If you are going to lap the newel down the face of the balcony or drop it down in the floor for mounting purposes, add this amount to the length.

Balcony Newel Length



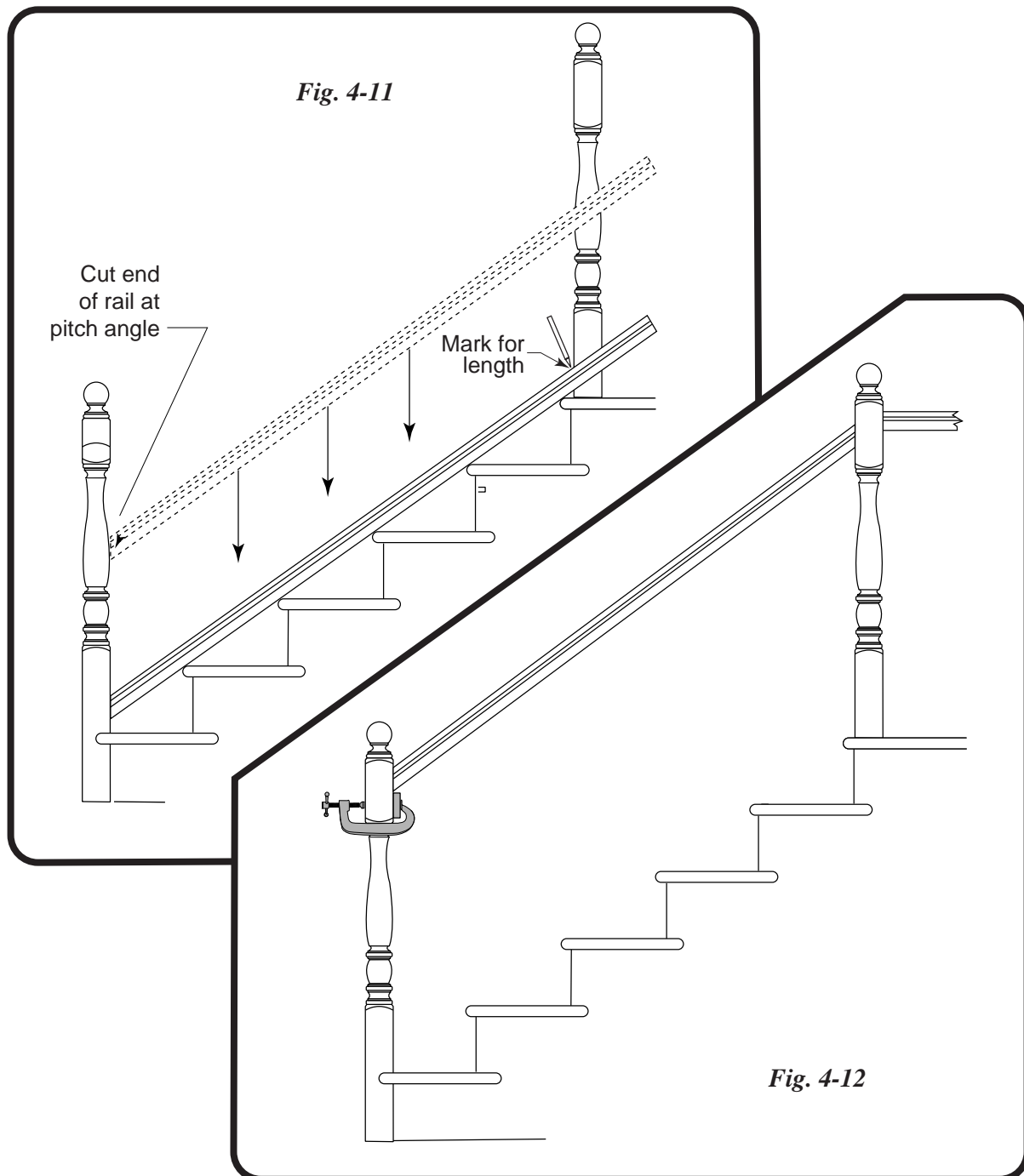
7. Cut all newels to the proper length.
8. Bolt newels into place using the appropriate hardware. Make sure that the centerlines match up with the center of the corresponding newel side.
9. Measure down from the top of each newel the desired reveal and scribe a line.
10. Cut rail sections to fit in between each newel and rail bolt into place. Make sure each rail section is on the reveal line mark. Please note Fig. 4-10 on prior page.
11. Cut landing tread and fit the tread between newels.
12. Using nails and construction adhesive, secure landing tread to floor.
13. Attach appropriate trim.

Post-to-Post Half Newels

1. Cut half newel to proper length. Bolt newel to wall using the appropriate hardware. Make sure that the centerlines match up with the center of the corresponding newel side.
2. Measure down from the top of each newel the desired reveal and scribe a line.
3. Cut rail sections to fit in between each newel and rail bolt into place. Make sure each rail section is on the reveal line marks.
4. Cut landing tread and fit the tread between newels.
5. Using nails and construction adhesive, secure landing tread to floor.

Installing Rake Rail Sections (Upper and Lower)

1. Select a piece of rail long enough to reach between the newels. On one end of the rail, make a cut at an angle equal to the pitch of the stair. *Note: Use a pitch block to determine this angle; see instructions on making a pitch block in Chapter 3. The cut is made to fit the bottom newel.*
2. Lay the rail on the treads and let the angled end slide tightly against the lower newel. If it does not fit tightly, adjust the angle cut until it does. Please note Fig. 4-11 here.



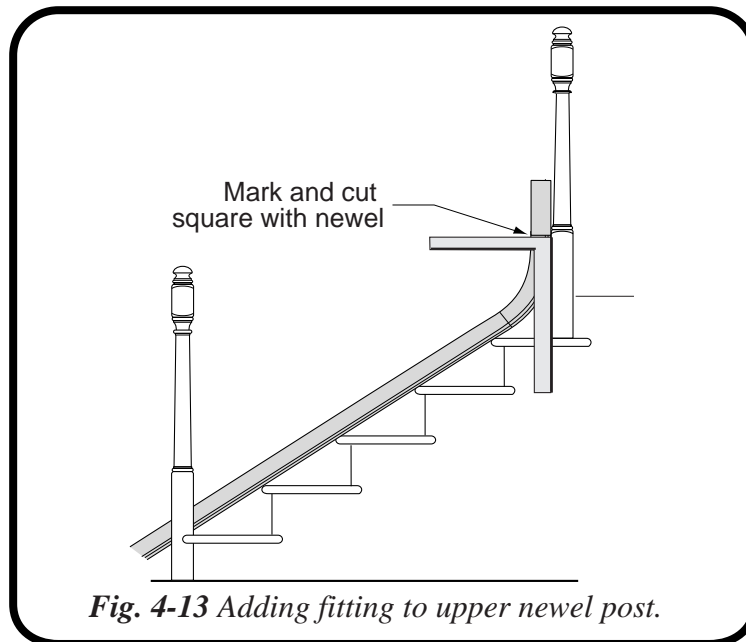
3. Scribe a line where the rail intersects with the top newel. Cut the rail along the line.
4. Measure down the reveal plus the thickness of the rail (on the plumb) from the top of the bottom newel.
5. Clamp a block below the mark. Note Fig. 4-12 on previous page.
6. Set the rail into place and bolt as needed.
7. Attach appropriate trim.

Installing Post-to-Post Rail with Fittings

The post-to-post balustrade system with fittings is more complicated than the standard post-to-post system. The complexity yields a wider variety of applications than the standard post-to-post.

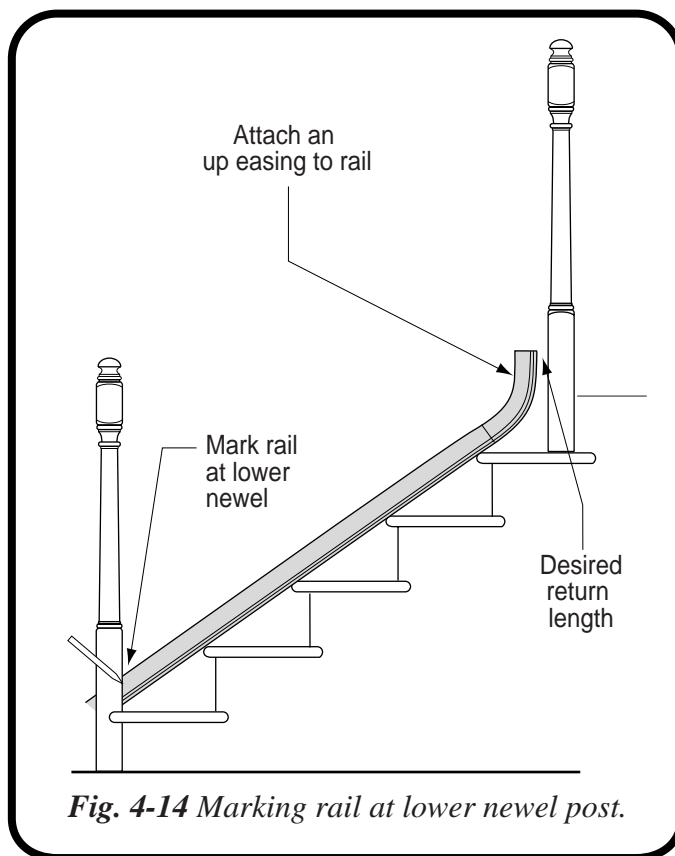
To install post-to post systems with fittings, cut and install newels as described in the standard post-to-post section (without fittings). The post-to-post with fittings system uses newels that have the same size top square. (Generally 5 - 7-inches.)

1. Make a square cut on the end of the handrail.
2. Attach an up easing to the end of the rail with a rail bolt.
3. Lay the rail on top of treads on the first run. Please note Fig. 4-13 here.

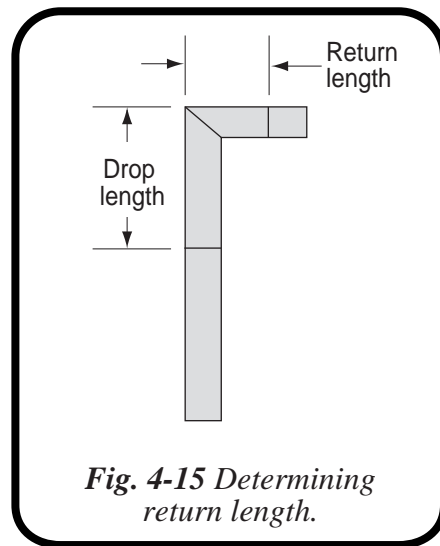


4. Slide rail upwards until the fitting touches the face of the landing newel.

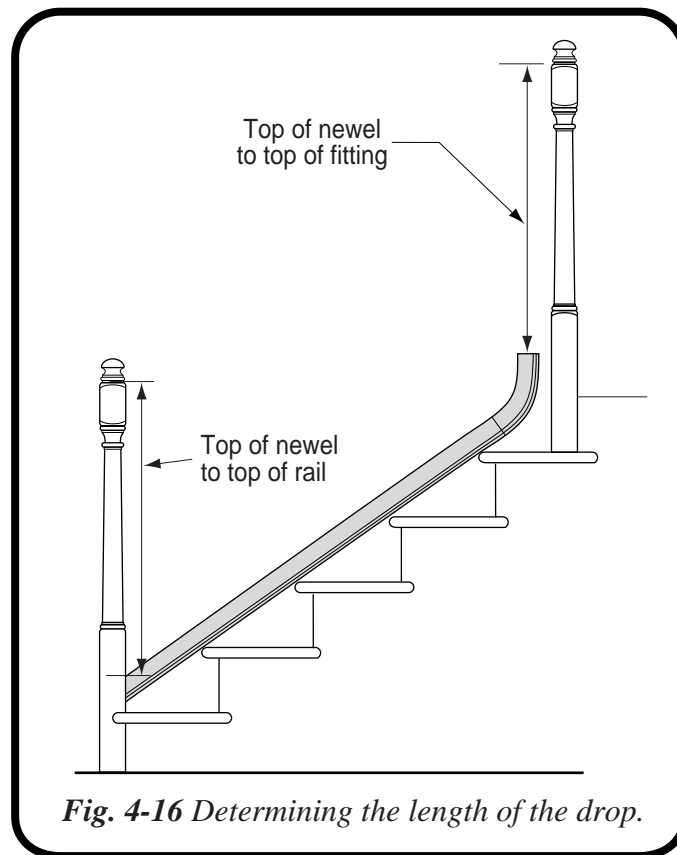
5. At the point where the fitting touches the face of the landing newel, scribe a line on the fitting perpendicular to the newel using a square.
6. Cut the up easing off on this line.
7. Lay rail back on to the treads and slide the rail up until the fitting is the desired distance away from the face of the newel.
8. At the face of the bottom newel, scribe a line with the pitch of the rail. Please note Fig. 4-14 here.



9. Cut off the bottom end of rail at this line.
10. Place rail back onto the treads with the bottom end fitted tightly against the face of the bottom newel.
11. Measure the distance from the back of the fitting to the face of the newel and add to this distance the thickness of the rail. This is your return length. Please note Fig. 4-15 here.

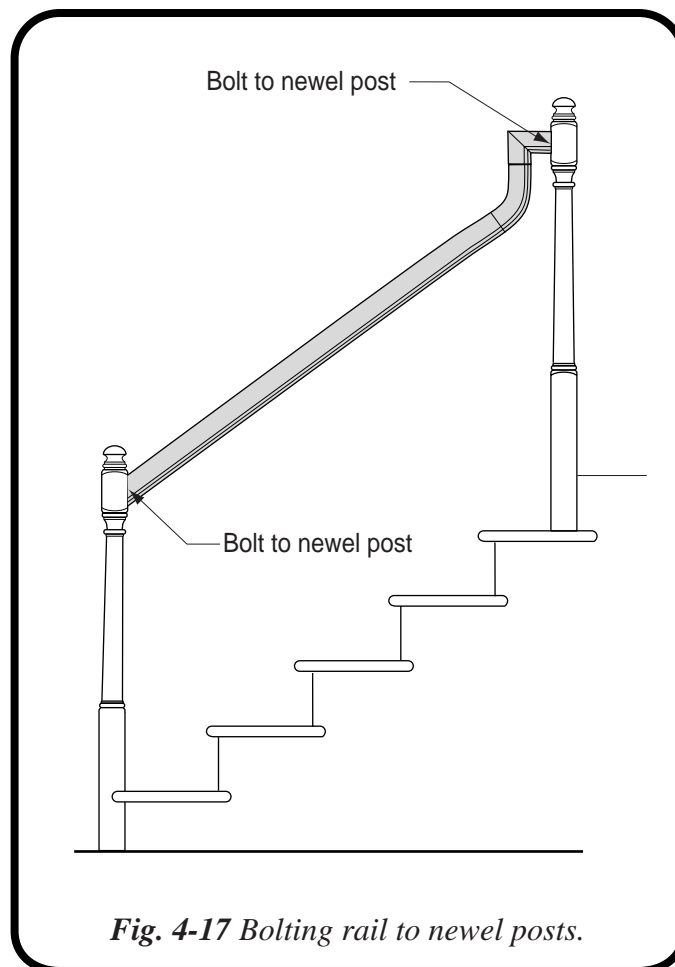


12. Measure the distance from the top of the rail to the top of the bottom newel. Please note Fig. 4-16 here.



13. Measure the distance from the top of the fitting to the top of the upper newel.
 14. Subtract the distance from the distance in Step 13. This is the length of your drop or neck.

15. Mark the gooseneck and make the cut.
16. Attach gooseneck to the fitting.
17. Raise rail up to the proper rail height and bolt each end to the newels. Please note Fig. 4-17 here.



Chapter 4: Things to Remember

1. Always consult your local building codes before building a stair
2. Do not forget to add slope difference to post-to-post rake newels.
3. Layout rail centerline and newel placement prior to installation.
4. Turn laminated side of newel in the least visible direction.
5. Use the proper type newel for each location (i.e. 5-,7-,10- and 13-inch face newels).
6. Securely glue and bolt all newels to framing.
7. Make sure that all newels are plumb.
8. Place rail parallel to treads.
9. Always glue and bolt rail securely into place.