

PRE-DRILLED RAIL GUIDE INSTRUCTIONS

1. Select the appropriate rail size.

Example:

3 5/8"
5 1/2"
7 1/4"
12"

2. Select the appropriate rail length.

Example:

48"
60"
72"
96"
120"
144"

3. Select a Baluster Style.

Example:

20-250

4. Follow the chart across to the Pre-Drilled SKU number on the guide. This will be the number you will use when ordering.

Example:

PD-100-48-250-10

PD = Pre-Drilled
100 = Rail Number
48 = Rail Length
250 = Baluster Style
10 = Required Number of Holes
in Pre-Drilled Rail Section

NOTE: Pre-Drilled Rail lead time is 10 working days from the receipt of order.

PRE-ASSEMBLED RAIL GUIDE INSTRUCTIONS

1. Select the appropriate rail size.

Example:

3 5/8"
5 1/2"
7 1/4"
12"

2. Select the appropriate rail length.

Example:

48"
60"
72"
96"
120"
144"

3. Select a Baluster Style.

Example:

20-250

4. Select the appropriate baluster height.

Example:

24"
36"
42"

5. Follow the chart across to the Pre-Assembled SKU number on the guide. This will be the number you will use when ordering.

Example:

PA-100-48-250-24-10

PA = Pre-Assembled
100 = Rail Number
48 = Rail Length
250 = Baluster Style
24 = Height of Baluster
10 = Required Number of Balusters
used in Pre-Assembled
Rail Section

NOTE: Pre-Assembled Rail lead time is 15 working days from the receipt of order.

Pre-Drilled Rail Guide - 3 5/8" Rail

Rail Size	Rail Length in inches	Rail SKU Number	Baluster SKU Number	Baluster Spacing	Number of Balusters Required	Pre-Drilled SKU Number
3-5/8"	48	21-100-4	20-100	4-3/4"	10	PD-100-48-100-10
	60	21-100-5			13	PD-100-60-100-13
	72	21-100-6			15	PD-100-72-100-15
	96	21-100-8			20	PD-100-96-100-20
	120	21-100-10			25	PD-100-120-100-25
	144	21-100-12			30	PD-100-144-100-30
3-5/8"	48	21-100-4	20-170	5-1/4"	9	PD-100-48-170-9
	60	21-100-5			11	PD-100-60-170-11
	72	21-100-6			14	PD-100-72-170-14
	96	21-100-8			18	PD-100-96-170-18
	120	21-100-10			23	PD-100-120-170-23
	144	21-100-12			28	PD-100-144-170-28
3-5/8"	48	21-100-4	20-230	5-1/2"	8	PD-100-48-230-8
	60	21-100-5			11	PD-100-60-230-11
	72	21-100-6			14	PD-100-72-230-14
	96	21-100-8			18	PD-100-96-230-18
	120	21-100-10			22	PD-100-120-230-22
	144	21-100-12			26	PD-100-144-230-26
3-5/8"	48	21-100-4	20-231	5-1/2"	8	PD-100-48-231-8
	60	21-100-5			11	PD-100-60-231-11
	72	21-100-6			14	PD-100-72-231-14
	96	21-100-8			18	PD-100-96-231-18
	120	21-100-10			22	PD-100-120-231-22
	144	21-100-12			26	PD-100-144-231-26
3-5/8"	48	21-100-4	20-250	5"	10	PD-100-48-250-10
	60	21-100-5			12	PD-100-60-250-12
	72	21-100-6			14	PD-100-72-250-14
	96	21-100-8			20	PD-100-96-250-20
	120	21-100-10			24	PD-100-120-250-24
	144	21-100-12			29	PD-100-144-250-29

Rail Size	Rail Length in inches	Rail SKU Number	Baluster SKU Number	Baluster Spacing	Number of Balusters Required	Pre-Drilled SKU Number
3-5/8"	48	21-100-4	20-310	5-3/4"	8	PD-100-48-310-8
	60	21-100-5			11	PD-100-60-310-11
	72	21-100-6			14	PD-100-72-310-14
	96	21-100-8			18	PD-100-96-310-18
	120	21-100-10			22	PD-100-120-310-22
	144	21-100-12			26	PD-100-144-310-26
3-5/8"	48	21-100-4	20-315	5"	10	PD-100-48-315-10
	60	21-100-5			12	PD-100-60-315-12
	72	21-100-6			14	PD-100-72-315-14
	96	21-100-8			20	PD-100-96-315-20
	120	21-100-10			24	PD-100-120-315-24
	144	21-100-12			29	PD-100-144-315-29
3-5/8"	48	21-100-4	20-320	4-7/8"	10	PD-100-48-320-10
	60	21-100-5			12	PD-100-60-320-12
	72	21-100-6			14	PD-100-72-320-14
	96	21-100-8			20	PD-100-96-320-20
	120	21-100-10			24	PD-100-120-320-24
	144	21-100-12			29	PD-100-144-320-29
3-5/8"	48	21-100-4	20-330	4-7/8"	10	PD-100-48-330-10
	60	21-100-5			12	PD-100-60-330-12
	72	21-100-6			14	PD-100-72-330-14
	96	21-100-8			20	PD-100-96-330-20
	120	21-100-10			24	PD-100-120-330-24
	144	21-100-12			29	PD-100-144-330-29
3-5/8"	48	21-100-4	20-380	5-1/4"	9	PD-100-48-380-9
	60	21-100-5			11	PD-100-60-380-11
	72	21-100-6			14	PD-100-72-380-14
	96	21-100-8			18	PD-100-96-380-18
	120	21-100-10			23	PD-100-120-380-23
	144	21-100-12			28	PD-100-144-380-28

Pre-Assembled Rail Guide - 3 5/8" Rail

Rail Size	Rail Length in inches	Rail SKU Number	Baluster SKU Number	Baluster Size	Number of Balusters Required	Pre-Assembled SKU Number
3-5/8"	48	21-100-4	20-100	24	10	PA-100-48-100-24-10
	60	21-100-5			13	PA-100-60-100-24-13
	72	21-100-6			15	PA-100-72-100-24-15
	96	21-100-8			20	PA-100-96-100-24-20
	120	21-100-10			25	PA-100-120-100-24-25
	144	21-100-12			30	PA-100-144-100-24-30
3-5/8"	48	21-100-4	20-100	28	10	PA-100-48-100-28-10
	60	21-100-5			13	PA-100-60-100-28-13
	72	21-100-6			15	PA-100-72-100-28-15
	96	21-100-8			20	PA-100-96-100-28-20
	120	21-100-10			25	PA-100-120-100-28-25
	144	21-100-12			30	PA-100-144-100-28-30
3-5/8"	48	21-100-4	20-170	20	9	PA-100-48-170-20-9
	60	21-100-5			11	PA-100-60-170-20-11
	72	21-100-6			14	PA-100-72-170-20-14
	96	21-100-8			18	PA-100-96-170-20-18
	120	21-100-10			23	PA-100-120-170-20-23
	144	21-100-12			28	PA-100-144-170-20-28
3-5/8"	48	21-100-4	20-170	24	9	PA-100-48-170-24-9
	60	21-100-5			11	PA-100-60-170-24-11
	72	21-100-6			14	PA-100-72-170-24-14
	96	21-100-8			18	PA-100-96-170-24-18
	120	21-100-10			23	PA-100-120-170-24-23
	144	21-100-12			28	PA-100-144-170-24-28
3-5/8"	48	21-100-4	20-230	20	8	PA-100-48-230-20-8
	60	21-100-5			11	PA-100-60-230-20-11
	72	21-100-6			14	PA-100-72-230-20-14
	96	21-100-8			18	PA-100-96-230-20-18
	120	21-100-10			22	PA-100-120-230-20-22
	144	21-100-12			26	PA-100-144-230-20-26
3-5/8"	48	21-100-4	20-230	22	8	PA-100-48-230-22-8
	60	21-100-5			11	PA-100-60-230-22-11
	72	21-100-6			14	PA-100-72-230-22-14
	96	21-100-8			18	PA-100-96-230-22-18
	120	21-100-10			22	PA-100-120-230-22-22
	144	21-100-12			26	PA-100-144-230-22-26

Rail Size	Rail Length in inches	Rail SKU Number	Baluster SKU Number	Baluster Size	Number of Balusters Required	Pre-Assembled SKU Number
3-5/8"	48	21-100-4	20-230	24	8	PA-100-48-230-24-8
	60	21-100-5			11	PA-100-60-230-24-11
	72	21-100-6			14	PA-100-72-230-24-14
	96	21-100-8			18	PA-100-96-230-24-18
	120	21-100-10			22	PA-100-120-230-24-22
	144	21-100-12			26	PA-100-144-230-24-26
3-5/8"	48	21-100-4	20-230	28	8	PA-100-48-230-28-8
	60	21-100-5			11	PA-100-60-230-28-11
	72	21-100-6			14	PA-100-72-230-28-14
	96	21-100-8			18	PA-100-96-230-28-18
	120	21-100-10			22	PA-100-120-230-28-22
	144	21-100-12			26	PA-100-144-230-28-26
3-5/8"	48	21-100-4	20-230	32	8	PA-100-48-230-32-8
	60	21-100-5			11	PA-100-60-230-32-11
	72	21-100-6			14	PA-100-72-230-32-14
	96	21-100-8			18	PA-100-96-230-32-18
	120	21-100-10			22	PA-100-120-230-32-22
	144	21-100-12			26	PA-100-144-230-32-26
3-5/8"	48	21-100-4	20-230	36	8	PA-100-48-230-36-8
	60	21-100-5			11	PA-100-60-230-36-11
	72	21-100-6			14	PA-100-72-230-36-14
	96	21-100-8			18	PA-100-96-230-36-18
	120	21-100-10			22	PA-100-120-230-36-22
	144	21-100-12			26	PA-100-144-230-36-26
3-5/8"	48	21-100-4	20-231	24	8	PA-100-48-231-24-8
	60	21-100-5			11	PA-100-60-231-24-11
	72	21-100-6			14	PA-100-72-231-24-14
	96	21-100-8			18	PA-100-96-231-24-18
	120	21-100-10			22	PA-100-120-231-24-22
	144	21-100-12			26	PA-100-144-231-24-26
3-5/8"	48	21-100-4	20-250	20	10	PA-100-48-250-20-10
	60	21-100-5			12	PA-100-60-250-20-12
	72	21-100-6			14	PA-100-72-250-20-14
	96	21-100-8			20	PA-100-96-250-20-20
	120	21-100-10			24	PA-100-120-250-20-24
	144	21-100-12			29	PA-100-144-250-20-29

Pre-Assembled Rail Guide - 3 5/8" Rail

Rail Size	Rail Length in inches	Rail SKU Number	Baluster SKU Number	Baluster Size	Number of Balusters Required	Pre-Assembled SKU Number
3-5/8"	48	21-100-4	20-250	24	10	PA-100-48-250-24-10
	60	21-100-5			12	PA-100-60-250-24-12
	72	21-100-6			14	PA-100-72-250-24-14
	96	21-100-8			20	PA-100-96-250-24-20
	120	21-100-10			24	PA-100-120-250-24-24
	144	21-100-12			29	PA-100-144-250-24-29
3-5/8"	48	21-100-4	20-250	28	10	PA-100-48-250-28-10
	60	21-100-5			12	PA-100-60-250-28-12
	72	21-100-6			14	PA-100-72-250-28-14
	96	21-100-8			20	PA-100-96-250-28-20
	120	21-100-10			24	PA-100-120-250-28-24
	144	21-100-12			29	PA-100-144-250-28-29
3-5/8"	48	21-100-4	20-250	30	10	PA-100-48-250-30-10
	60	21-100-5			12	PA-100-60-250-30-12
	72	21-100-6			14	PA-100-72-250-30-14
	96	21-100-8			20	PA-100-96-250-30-20
	120	21-100-10			24	PA-100-120-250-30-24
	144	21-100-12			29	PA-100-144-250-30-29
3-5/8"	48	21-100-4	20-250	32	10	PA-100-48-250-32-10
	60	21-100-5			12	PA-100-60-250-32-12
	72	21-100-6			14	PA-100-72-250-32-14
	96	21-100-8			20	PA-100-96-250-32-20
	120	21-100-10			24	PA-100-120-250-32-24
	144	21-100-12			29	PA-100-144-250-32-29
3-5/8"	48	21-100-4	20-250	34	10	PA-100-48-250-34-10
	60	21-100-5			12	PA-100-60-250-34-12
	72	21-100-6			14	PA-100-72-250-34-14
	96	21-100-8			20	PA-100-96-250-34-20
	120	21-100-10			24	PA-100-120-250-34-24
	144	21-100-12			29	PA-100-144-250-34-29
3-5/8"	48	21-100-4	20-250	36	10	PA-100-48-250-36-10
	60	21-100-5			12	PA-100-60-250-36-12
	72	21-100-6			14	PA-100-72-250-36-14
	96	21-100-8			20	PA-100-96-250-36-20
	120	21-100-10			24	PA-100-120-250-36-24
	144	21-100-12			29	PA-100-144-250-36-29

Rail Size	Rail Length in inches	Rail SKU Number	Baluster SKU Number	Baluster Size	Number of Balusters Required	Pre-Assembled SKU Number
3-5/8"	48	21-100-4	20-250	44	10	PA-100-48-250-44-10
	60	21-100-5			12	PA-100-60-250-44-12
	72	21-100-6			14	PA-100-72-250-44-14
	96	21-100-8			20	PA-100-96-250-44-20
	120	21-100-10			24	PA-100-120-250-44-24
	144	21-100-12			29	PA-100-144-250-44-29
3-5/8"	48	21-100-4	20-310	22	8	PA-100-48-310-22-8
	60	21-100-5			11	PA-100-60-310-22-11
	72	21-100-6			14	PA-100-72-310-22-14
	96	21-100-8			18	PA-100-96-310-22-18
	120	21-100-10			22	PA-100-120-310-22-22
	144	21-100-12			26	PA-100-144-310-22-26
3-5/8"	48	21-100-4	20-315	20	10	PA-100-48-315-20-10
	60	21-100-5			12	PA-100-60-315-20-12
	72	21-100-6			14	PA-100-72-315-20-14
	96	21-100-8			20	PA-100-96-315-20-20
	120	21-100-10			24	PA-100-120-315-20-24
	144	21-100-12			29	PA-100-144-315-20-29
3-5/8"	48	21-100-4	20-320	28	10	PA-100-48-320-28-10
	60	21-100-5			12	PA-100-60-320-28-12
	72	21-100-6			14	PA-100-72-320-28-14
	96	21-100-8			20	PA-100-96-320-28-20
	120	21-100-10			24	PA-100-120-320-28-24
	144	21-100-12			29	PA-100-144-320-28-29
3-5/8"	48	21-100-4	20-330	28	10	PA-100-48-330-28-10
	60	21-100-5			12	PA-100-60-330-28-12
	72	21-100-6			14	PA-100-72-330-28-14
	96	21-100-8			20	PA-100-96-330-28-20
	120	21-100-10			24	PA-100-120-330-28-24
	144	21-100-12			29	PA-100-144-330-28-29
3-5/8"	48	21-100-4	20-380	22	9	PA-100-48-380-22-9
	60	21-100-5			11	PA-100-60-380-22-11
	72	21-100-6			14	PA-100-72-380-22-14
	96	21-100-8			18	PA-100-96-380-22-18
	120	21-100-10			23	PA-100-120-380-22-23
	144	21-100-12			28	PA-100-144-380-22-28

1. Locate and mark the center points for the placement of each newel post on the surface to which you are attaching them to. (See Drawing A)

2. Use the appropriate fasteners when attaching the mounting plate to either wood or concrete. (See Drawing B1 & B2)

3. Wood Deck Installation - Place floor flange over center point and attach flange to deck and blocking with 2-1/2" lag bolts. (As Shown in Drawing B1)

4. Concrete Installation - Place floor flange over center point and mark anchor locations. Drill 3/8" hole to a minimum depth of 1-1/8". Clean concrete dust out of hole, and then drop in anchor. Tap anchor in until flush with top of hole. Put flange in place and insert 1/4" bolts and tighten. (As Shown in Drawing B2)

5. Measure height of baluster (not including pipe) and height of bottom rail. This will be your spacing between the "L" brackets on the newel post. (Drawing C1) Accurately transfer this dimension to the newel post. Using a wood chisel, mortise out the newel post 3/16" deep to receive each "L" bracket. Make sure each "L" bracket is centered and level on the newel post. Mark the location of bracket holes on newel post. (As Shown in Drawing C2)

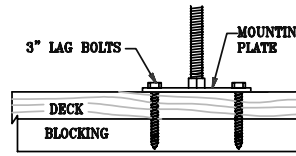
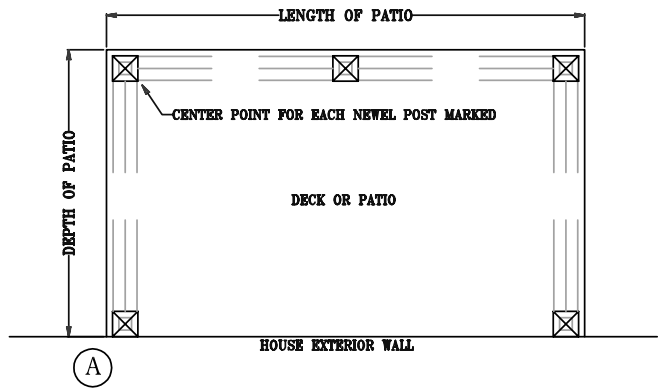
6. Installation of Bottom "L" Bracket - Drill the (2) 1/4" x 2" machine bolts through the "L" bracket vertical holes and pre-drilled holes on the newel post. Secure the (2) 1/4" x 2" machine bolts using (1) flat washer, (1) lock washer, and (1) 1/4" nut inside the newel post against the PVC pipe for each bolt. Thread (1) 5/16" x 1-1/2" hex head bolt through the threaded insert on bottom of "L" bracket. (NOTE: Bottom "L" bracket has (3) holes - Top "L" bracket has (4) holes.) (As Shown in Drawing D2)

7. Center the newel post over the mounted floor flange. Screw the 1/2" "All-Thread" rod into the nut on the floor flange. Place the "C" channel, flat side down against the newel post (As Shown in Drawing E) and secure with (1) 1/2" lock washer and (1) 1/2" nut and hand tighten.

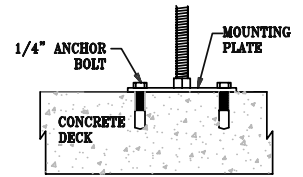
8. Installation of Top "L" Bracket - Drill the (2) 1/4" x 2" machine bolts through the "L" bracket vertical holes and pre-drilled holes on the newel post. Secure the (2) 1/4" x 2" machine bolts using (1) flat washer, (1) lock washer, and (1) 1/4" nut inside the newel post against the PVC pipe for each bolt. (See Drawing D1)

9. Measure actual lengths of top and bottom rails needed. (See Drawing F)

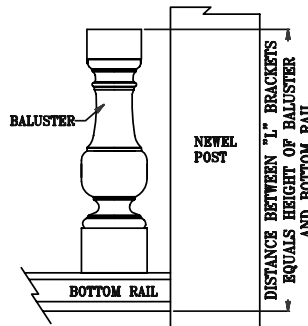
10. Using a wood chisel, mortise out the bottom ends of both the top and bottom rails 3/16" deep. (See Drawing G). **Make sure that the mortise cuts for both the top and bottom rail are centered. This can be done by "Dry Fitting" the top and bottom rails to the newel post "L" brackets.** Mark all hole locations from "L" bracket to the top and bottom rails. Pre-drill 5/32" pilot holes on top rail for (2) #14-2 self tapping screws. Drill 3/8" hole in bottom of bottom rail through the rail PVC pipe to allow (1) 5/16" x 1-1/2" hex head bolt to pass through. (As Shown in Drawing D2)



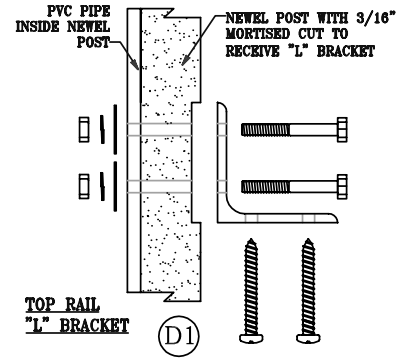
(B1)



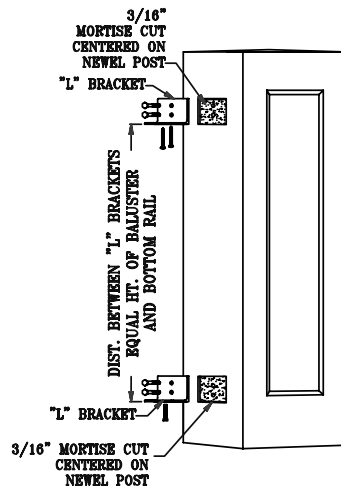
(B2)



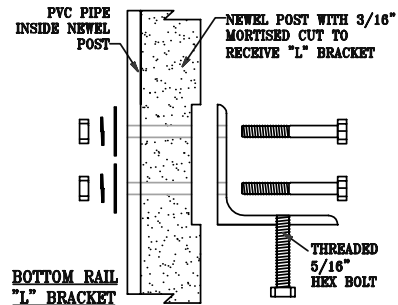
(C1)



(D1)



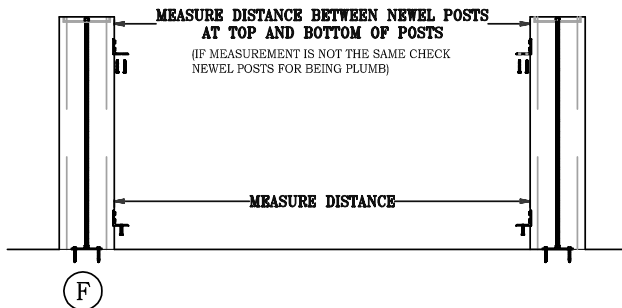
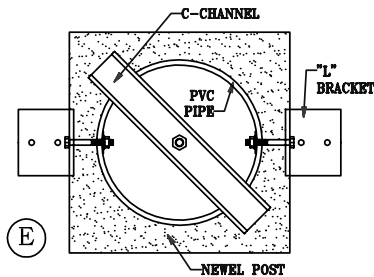
(C2)



(D2)

11. How to calculate baluster spacing.

- A. Once you have established the actual lengths for the top and bottom rails, mark the center for each of the rails. (See Drawing H1)
- B. Using the total length of each rail, deduct 5" (Allowance for installation kit).
- C. Deduct the width of the base of the baluster that you will be using (this will be your net measurement for which you will establish your baluster spacing).
- D. Using this net measurement divide by the "S" measurement (Spacing on Center) shown for your baluster in our catalog.
- E. Round up to the next whole number.
- F. Divide your net measurement by E (above). This is your center spacing between balusters. This measurement cannot be greater than your "S" measurement (Spacing on Center).
- G. You will have to add 1 more baluster to the number of balusters you have calculated in point E (above).

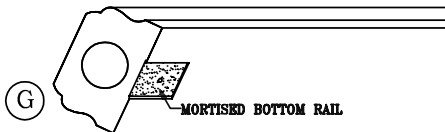
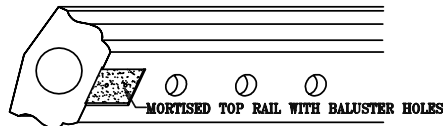


Example:

- 1. Using a 120" rail
- 2. Base measurement for baluster = 5.25"
- 3. "S" Measurement = 6.75"

This would be the calculation; you would use to calculate the center to center spacing and the number of balusters you would need to use.

- Point A above = 120"
- Point B above = 115" (120" - 5")
- Point C above = 109.75" (115" - 5.25")
- Point D above = 16.25" (109.75" - 6.75")
- Point E above = 17
- Point F above = 6.45" center to center (109.75" ÷ 17)
- Point G above = 18 (17+1)



NOTE: If the number of balusters required (From point G) equals an even number:

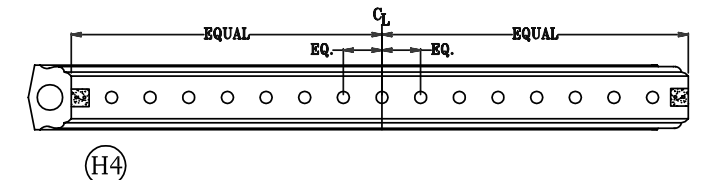
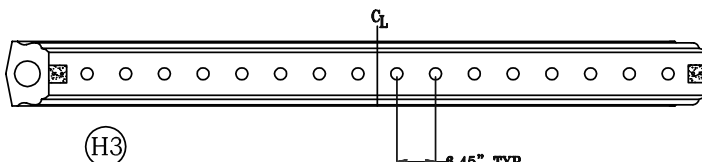
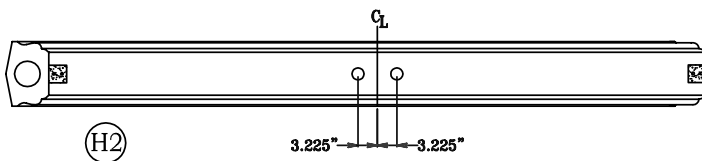
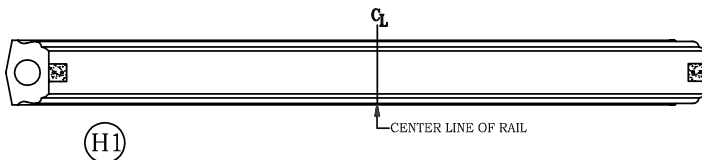
You will need to divide your center spacing of 6.45" by 2 and mark that distance to the left and to the right equally of your centerline. (See Drawing H2). All remaining balusters will then be centered from those 2 points at 6.45". (Drawing H3 shows 8 balusters equally spaced to the left and to the right of your centerline.)

If the number of balusters required (From point G) equals an odd number:

Your first baluster will be placed on the centerline with the remaining balusters equally spaced to the left and to the right. (Drawing H4)

Apex recommends, prior to the installation, that you check with your local building inspector for all codes regarding baluster spacing and railing heights.

For illustration purposes, we have provided you with an example of the 4" ball code commonly used by some building codes. (See Drawing K)

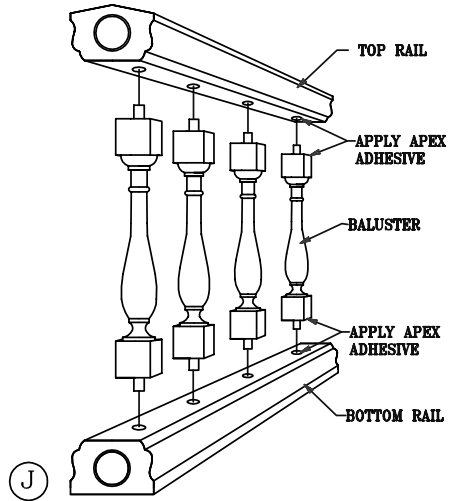


12. Using the proper sized drill bit, matched to the diameter of the baluster pipe, drill the center lined marked baluster holes through the bottom of the top rail and through the top of the bottom rail.

13. Lightly sand all paint from both ends of baluster where they join to the top and bottom rails for a tight fit. Using Apex adhesive, apply adhesive in pipe holes of rail and on both ends of the balusters. (See Drawing K) Secure balusters to the top and bottom rails, making sure all balusters are "Square" to the rails. Use bar or strap clamps to pull rail section tight and wipe away excess adhesive from around balusters. (See Drawing L & M)

14. Apply Apex adhesive to both ends of top and bottom rails. Place clamped railing section over top and bottom of newel post brackets. Attach appropriate screws/bolts in brackets on bottom of top and bottom rails. Check fit between newel posts and rails. Adjust if necessary for a tight fit. Tighten newel posts last by tightening nut on all thread rod connected to "C" channel.

15. Wipe any excess adhesive from between rails and newel post. Leave clamps in place for 24 Hours. Caulk connections between rails and balusters and rails and newel posts with a highly paintable silicone latex caulk.



NOTE:

Support Blocks should be used every 48" or at midspace.

Newel posts must be used for continuous run of rails. Joining of rails together is improper installation and will void all factory warranties.

Structural integrity of the balustrade assemble is the responsibility of the installer.

