



PermaPorch® Rail Assembly & Installation Instructions

❖ International Building Code:

During the testing of ATI report number 80491.01 PermaPorch® rail passed testing standards for All Use Groups of the IBC. Sections of 42" high Standard PermaPorch® Rail with aluminum inserts and 1-1/4" square balusters were tested to determine a worst case scenario. The 10'-0" rail section was attached to a simulated wood wall construction for testing, as the 4'-0" and 6'-0" rail sections were attached to a PermaPorch® Structural Post Mount installed on a simulated concrete substrate and a mock wood deck.

❖ International Residential Code:

During the testing of ATI report number 80491.01 PermaPorch® rail passed testing standards for One- and Two-Family Dwelling requirements of the IRC. Sections of 42" high Standard PermaPorch® Rail with aluminum inserts and 1-1/4" square balusters were tested to determine a worst case scenario. Testing was performed on 8'-0" and 10'-0" sections attached to a PermaPorch® Structural Post Mount installed on a simulated concrete substrate and a mock wood deck.

❖ Important Information before you start:

These assembly guidelines will direct you through the process of assembling a section of PermaPorch® rail. Please keep in mind that they may not cover every assembly or installation scenario you may encounter. Since each installation is unique in its performance requirements, the ultimate installation method used is the sole responsibility of the installer. HB&G disclaims any liability or responsibility for the improper installation of this product. The purchaser is solely responsible for compliance with applicable local codes as to the rail's intended use. HB&G recommends that all designs be reviewed by a licensed architect, engineer or local building official before installation. HB&G provides independent laboratory test results to assist in your planning process at www.hbgcolumns.com

Preparation Tips:

1. Check local building codes and independent laboratory test results at www.hbgcolumns.com for: Maximum allowable rail length (*applies to rake rails up stairs*), required rail height (36"-42"), maximum allowable space between balusters (*usually, a 4" sphere may not pass through between the balusters*), space below bottom rail (*usually 3" max*).
2. Install all posts, newels, or columns according to their installation instructions and code requirements prior to installing the PermaPorch® rail.
3. If you are installing PermaPorch® railing to PermaCast® columns, the column base might need to be notched at accept bottom rail.

Painting/Caulking Tips:

1. PermaPorch® railing is pre-finished with a tough exterior grade coating that is warranted for 10 years against yellowing. When painting is desired, simply coat with an exterior paint, following manufacturer's instructions. Do not use dark colors. Dark colors are considered any color that falls within the L values of **0 to 56**. L (or LRV - *Light Reflective Value*) is a measure of lightness of an object, and ranges from 0 (black) to 100 (white). This information is available for your color choice from your paint supplier.

Each PermaPorch® Rail Kit Includes:

- Top Rail (Standard or Savannah)
- Top Aluminum Insert
- Bottom Rail
- Bottom Aluminum Insert
- Support Block
- Touch-up Paint is included with the 8'-0" and is available as an option for 4' & 6' kits.
- 29-1/4" x 1-1/2" Square Balusters
- Fastening Kit – Each Rail Fastening Kit Includes:
 - (4) 90° Aluminum Brackets – White Powder Coated
 - (12) #10 x 2 1/2" Button Head Stainless Steel Screws – White Powder Coated Heads
 - (16) #10 x 1 1/4" Button Head Stainless Steel Screws – White Powder Coated Heads

Assembling & Installing Rail

PermaPorch® Railing can be purchased in unassembled kits (36" rail height with 1 1/2" balusters only), pre-built sections (36" & 42" rail heights), or in carton quantities of individual components. Each installation must have: top rail, top rail insert, balusters, bottom rail, bottom rail insert, fastening kit and support block).

Assembling Rail if You Have Not Purchased Pre-built Section

1. Determine Length of Balusters
 - a. Check local building codes for required rail height
 - b. For rail section that is at least **36" high**, with **Standard** top rail and 3" tall support block, balusters need to be at least **28-3/8"** long.
 - c. For rail section that is at least **36" high**, with **Savannah** top rail and 3" tall support block, balusters need to be at least **28-5/8"** long.
 - d. For rail section that is at least **42" high**, with **Standard** top rail and 3" tall support block, balusters need to be **34-3/8"** long.
 - e. For rail section that is at least **42" high**, with **Savannah** top rail and 3" tall support block balusters need to be **34-5/8"** long.
2. Cut balusters to length required to achieve desired rail height.
3. Measure opening where PermaPorch® Railing is to be installed. If using round tapered PermaCast® columns or other tapered columns, take measurement for top rail and bottom rail separately, because the lengths will be different.

4. Cut the top and bottom PermaPorch® PVC railing to the proper lengths. Trim the aluminum inserts 1/2" shorter than the PVC rails using a circular saw or power miter box with a carbide tipped blade. (*PermaPorch® rail fastening brackets are 1/8" (.1295") thick. A bracket is needed for each end – See Figure #2).*
5. Determine the number of balusters you will have in your rail section and the amount of space between each baluster. **See Table #1 for an example of how to calculate the number of balusters you will need and the space between them. The baluster spacing will range between 3-1/2" and 4" between the balusters. NEVER SPACE THE BALUSTERS MORE THAN 4" APART!**

Table #1 **Example of Baluster Layout Calculation**

STEP 1	Measure the distance of the space into which your rail section will be installed.	If top and bottom rail distances are different, use the longer	78.00	A
STEP 2	Baluster thickness (1-1/2" or 1-1/4")	Verify your baluster thickness	1.25	B
STEP 3	Maximum allowable space between balusters	Per Code	4.00	C
STEP 4	Baluster thickness + Maximum allowable space	(B) + (C) =	5.25	D
STEP 5	Divide A by D, add 1, and round up to the nearest whole number.	Round up to the nearest whole number (A / D) + 1 =	16	E
STEP 6	The number of balusters = (E) minus 1	(E) - 1 =	15	F
STEP 7	Multiply the number of balusters (F) by the baluster thickness (B)	(F) X (B) =	18.75	G
STEP 8	Subtract (G) from (A)	(A) - (G) =	59.25	H
STEP 9	Divide (H) by (E) and round up to the nearest 1/16th inch. This is the distance between each baluster, and the distance between the last baluster and the wall/column/newel post.	(H) / (E) =	3 11/16	I

6. Measure to and mark the center points of the top rail aluminum insert and the bottom PVC rail. ***If your rail section requires an even number of balusters, the center point of the rail will be in the middle of a space between the balusters. If the length of your rail section requires an odd number of balusters, the center point of the rail will be in the middle of a baluster.***
7. Mark the locations of the center of each baluster on the underside of the aluminum insert and the top side of the PVC bottom rail. ***Double check your layout to make sure the holes you drill through the aluminum rail insert line up with those in the bottom PVC rail, and that they are spaced the same distance apart!*** Drill 7/32" diameter holes where you have marked.
8. Choose a hole you drilled near the center of the top rail aluminum insert and place the first baluster into the slight channel on the underside of the insert. Screw through the hole in the insert into the center of the baluster. Use the #8 x 2-1/2" galvanized deck screws (*provided in fastening kit*). Do the same at the bottom, screwing through the holes in the PVC bottom rail into the center of the first baluster with the provided screws. Repeat this process for all the balusters. It is best to lay the rail components down on a workbench or flat surface while screwing the rail components together.
9. Apply non-acetone based construction adhesive to the **INSIDE** walls of the bottom PVC rail. Take the bottom rail aluminum insert and align the entire insert with the opening in the bottom PVC rail. The legs of bottom rail aluminum insert should be facing up into the interior of the bottom PVC rail. With even pressure gradually applied along its length, push the aluminum insert into the opening of the bottom PVC rail. The side walls of the PVC bottom rail will spread apart slightly as you push the aluminum insert until it snaps into place. When the adhesive that you applied dries, it will hold the aluminum insert permanently in place.

10. The Standard top PVC rail can be attached to the top aluminum insert using a non-acetone based construction adhesive (*and 1" galvanized deck screws used during the installation of the assembled rail section with the PermaPorch® Rail Fastening Kit*). Apply adhesive to the top of the aluminum insert and push the PVC top rail in place over the insert. The legs of the PVC top rail will spread slightly as you push, until it snaps into place.
11. If you are using the Savannah top rail, slide it over the top rail aluminum insert from one end. No adhesive is necessary.
12. If length of the rail section is over 4', you will need to install a support block. On the underside of the bottom rail, mark the center point and drill a 3/4" hole into the bottom of the aluminum insert to receive the 3/4" diameter dowel extending from the top of the support block. Apply non-acetone based construction adhesive to the top of the support block and insert into hole.

Installing Rail Section, After Assembly, Using PermaPorch® Rail Fastening Kit

These installation instructions are also included with rail fastening kit.

13. Pre-attach brackets to only the bottom rail aluminum insert. Pre-drill with 1/8" bit and attach with 1 1/4" stainless steel screws through the two center holes of the bracket. (*Figure #1*).
14. Position entire railing system in place, *being sure to locate the railing so the height of the rail section is in compliance with your local building codes*. Carefully mark posts/columns/wall for mounting location of top brackets (*Figure #2*). Then remove railing assembly and set aside.
15. Using the marks you just made to locate the brackets, position each bracket (*Figure #2*) and use a 1/8" drill bit to pre-drill through the two bracket mounting holes into the post/column/wall. **NOTE:** *If attaching brackets to material that is not suited to receive stainless steel screws alone, you will need to supply the appropriate fasteners/shields/anchors for the material into which you are fastening.*
16. Attach top rail brackets. If attaching to existing posts/columns/walls use two 2 1/2" stainless steel screws. If attaching to *PermaPorch® Square Newel* with integral *PermaPorch® Post Mount System*, use two 1 1/4" stainless steel screws.
17. Complete installation:
 - a) Place entire railing section into its final position and lower it onto top rail brackets.
 - b) Pre-drill into underside of the top rail aluminum insert, using the two outside holes and one center hole of each bracket. **See Figure #3.**
 - c) Pre-drill holes into post/column/wall through the mounting holes of the brackets that you previously attached to the bottom rail. **NOTE:** *If attaching brackets to material that is not suited to receive stainless steel screws alone, you will need to supply the appropriate fasteners/shields/anchors for the material into which you are fastening.*
 - d) Attach bottom rail brackets. If attaching to existing posts/columns/walls use two 2 1/2" stainless steel screws. If attaching to *PermaPorch® Square Newel* with integral *PermaPorch® Post Mount System*, use two 1 1/4" stainless steel screws. **See Figure #3.**
18. If you are installing a rail section with the Standard top rail, drill 1/8" diameter holes in the center of the underside of the aluminum insert every 16"-24". Using the 1" galvanized deck screws mentioned in **Step 10**, screw through the aluminum insert up into the underside of the top PVC rail. *The PVC top rail is thicker in the middle so it can receive the 1" screw.*
19. Be sure to caulk ends of rail at connection with newel, column, or wall with flexible exterior grade caulk.

Installing Factory Pre-built Rail Section with PermaPorch® Rail Fastening Kit

These installation instructions are also included with rail fastening kit.

1. With posts/columns firmly installed, take the pre-assembled rail section and slide the Standard or Savannah PVC TOP RAIL completely off of the top aluminum rail insert. Now slide the BOTTOM ALUMINUM INSERT out of and remove it completely from the bottom PVC rail.
2. Measure opening where PermaPorch® Railing is to be installed. If using round tapered PermaCast® columns or other tapered columns, take measurement for top rail and bottom rail separately, because the lengths will be different.
3. Cut the top and bottom PermaPorch® PVC railing to the proper lengths. The top PVC rail, which will have been separated from the pre-assembled rail section in **Step 1**, will be easily held in position to be cut with a circular saw or power miter box. The bottom PVC rail will still be attached to all the balusters and the rest of the pre-assembled rail section. If using a power miter box to cut the bottom PVC rail, you will need to set up additional supports to stabilize the pre-assembled rail section as you trim the ends of the aluminum insert in the power miter box. If using a hand-held circular saw, be sure to clamp or secure the rail section so it does not move when you cut it
4. Trim aluminum inserts 1/2" shorter than PVC rails using a circular saw or power miter box with a carbide tipped blade. The bottom aluminum insert, which will have been separated from the pre-assembled rail section in **Step 1**, will be easily held in position to be cut with a circular saw or power miter box. The top rail aluminum insert will still be attached to all the balusters and the rest of the pre-assembled rail section. If using a power miter box to cut the top aluminum insert, you will need to set up additional supports to stabilize the pre-assembled rail section as you trim the ends of the aluminum insert in the power miter box. If using a hand-held circular saw, be sure to clamp or secure the rail section so it does not move when you cut it.
5. Once you have trimmed the aluminum inserts, apply non-acetone based construction adhesive to the **INSIDE** walls of the bottom PVC rail. Take the bottom rail aluminum insert and align the entire insert with the opening in the bottom PVC rail. The legs of the bottom rail aluminum insert should be facing up into the interior of the bottom PVC rail. With even pressure gradually applied along its length, push the aluminum insert into the opening of the bottom PVC rail. The side walls of the PVC bottom rail will spread apart slightly as you push the aluminum insert until it snaps into place. When the adhesive that you applied dries, it will hold the aluminum insert permanently in place.
6. The Standard top PVC rail can be attached to the top aluminum insert using a non-acetone based construction adhesive (*and 1" galvanized deck screws used during the installation of the assembled rail section with the PermaPorch® Rail Fastening Kit*). Apply adhesive to the top of the aluminum insert and push the PVC top rail in place over the insert. The legs of the PVC top rail will spread slightly as you push, until it snaps into place.
7. If you are using the Savannah top rail, slide it over the top rail aluminum insert from one end. No adhesive is necessary.
8. Pre-attach brackets to only the bottom rail aluminum insert. Pre-drill with 1/8" bit and attach with 1 ¼" stainless steel screws through the two center holes of the bracket. **See Figure #1 and Figure #3.**
9. Position entire railing system in place, *being sure to locate the railing so the height of the rail section is in compliance with your local building codes.* Carefully mark posts/columns/wall for mounting location of top brackets (Figure #2). Then remove railing assembly and set aside.
10. Using the marks you just made to locate the brackets, position each bracket (Figure #2) and use a 1/8" drill bit to pre-drill through the two bracket mounting holes into the post/column/wall. **NOTE:** *If attaching brackets to material that is not suited to receive stainless steel screws alone, you will*

need to supply the appropriate fasteners/shields/anchors for the material into which you are fastening.

11. Attach top rail brackets. If attaching to existing posts/columns/walls, use two 2 ½" stainless steel screws. If attaching to *PermaPorch® Square Newel* with integral *PermaPorch® Post Mount System*, use two 1 ¼" stainless steel screws.
12. Complete installation:
 - a. Place entire railing section into its final position and lower it onto top rail brackets.
 - b. Pre-drill into underside of the top rail aluminum insert, using the two outside holes and one center hole of each bracket. **See Figure #3.**
 - c. Pre-drill holes into post/column/wall through the mounting holes of the brackets that you previously attached to the bottom rail. **NOTE: If attaching brackets to material that is not suited to receive stainless steel screws alone, you will need to supply the appropriate fasteners/shields/anchors for the material into which you are fastening.**
 - d. Attach bottom rail brackets. If attaching to existing posts/columns/walls use two 2 ½" stainless steel screws. If attaching to *PermaPorch® Square Newel* with integral *PermaPorch® Post Mount System*, use two 1 ¼" stainless steel screws. **See Figure #3.**
13. If you are installing a rail section with the Standard top rail, drill 1/8" diameter holes in the center of the underside of the aluminum insert every 16"-24". Using the 1" galvanized deck screws mentioned in **Step 10**, screw through the aluminum insert up into the underside of the top PVC rail. The PVC top rail is thicker in the middle so it can receive the 1" screw.

Figure #1

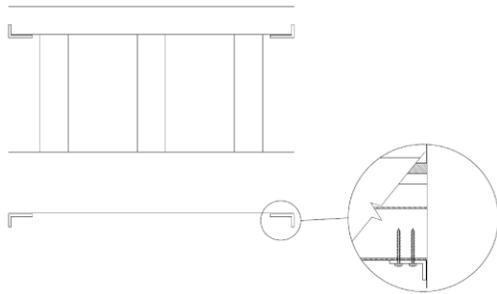


Figure #2

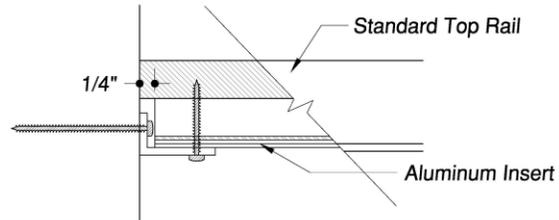


Figure #3

