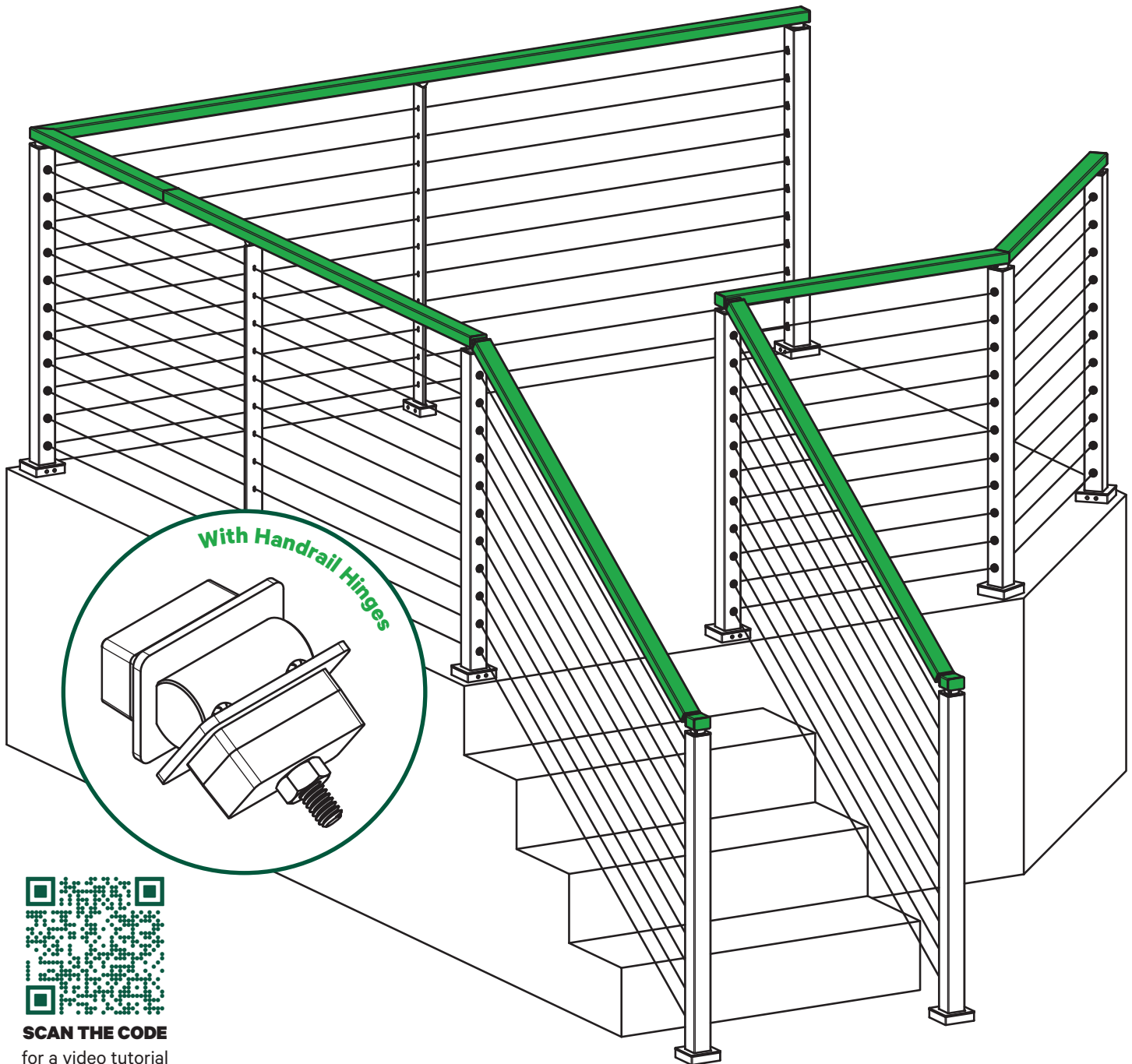


Order of Installation:

1. Set Posts
2. **Attach Handrail**
3. Install Cables

Reinforced Aluminum Handrail *setup guide*



SCAN THE CODE
for a video tutorial

got questions? we're here to help!

tools

- 7/32" drill bit*
- 11/64" drill bit*
- 5/32" drill bit*
- 5/32" driver*
- 3/16" Allen wrench*
- 3/32" Allen wrench*
- 1/8" Allen wrench*
- 7/16" socket or wrench
- 10-24 National Course tapered tap*
- 1/4-20 National Course tapered tap*
- T-Handle tap wrench*
- Handrail Clamp for Line Posts*
- Handrail Drill Guide and Template*
- Quick clamps
- Miter saw with a non-ferrous metal cutting blade
- Power drill
- Tape measure
- Speed square
- Angle finder
- File
- Fine-point pencil

supplies

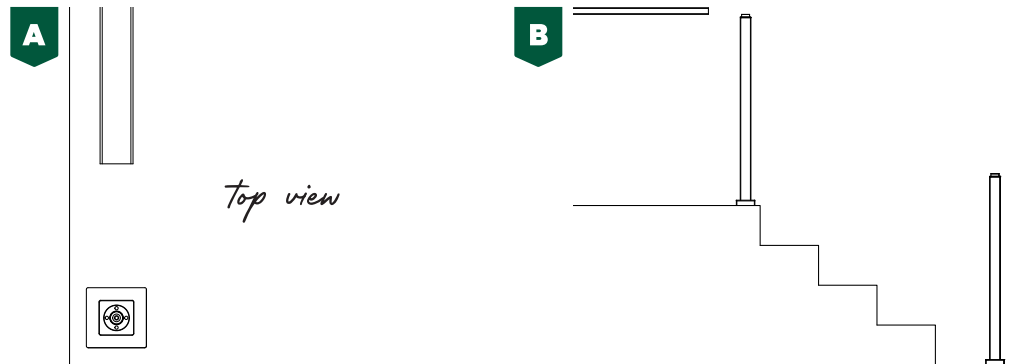
- Reinforced Aluminum Handrail*
- Signature Series Handrail Mounting Screws*
- Splines*
- Handrail Hinges*
- End Caps*
- Touch-up Paint*
- Painter's tape
- Machine oil (optional)
- Canned air (optional)*

*available at cablebullet.com

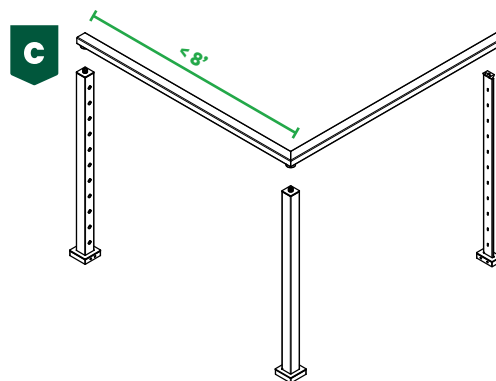
Installation Overview

⚠ READ BEFORE STARTING INSTALLATION

- 1 Ensure that all posts are set plumb and adhere to our post spacing guidelines. (See *Signature Series Post Setup Guide*.)
- 2 Start at one end and work your way along the run one connection (see **page 3**) at a time. Wait to install the fixed straight spline immediately before a corner or stair transition until prompted to do so.
- 3 When your railing transitions to either a corner (**A**) or stair (**B**) transition, stop your handrail short of the transitions and proceed to the appropriate connection section.

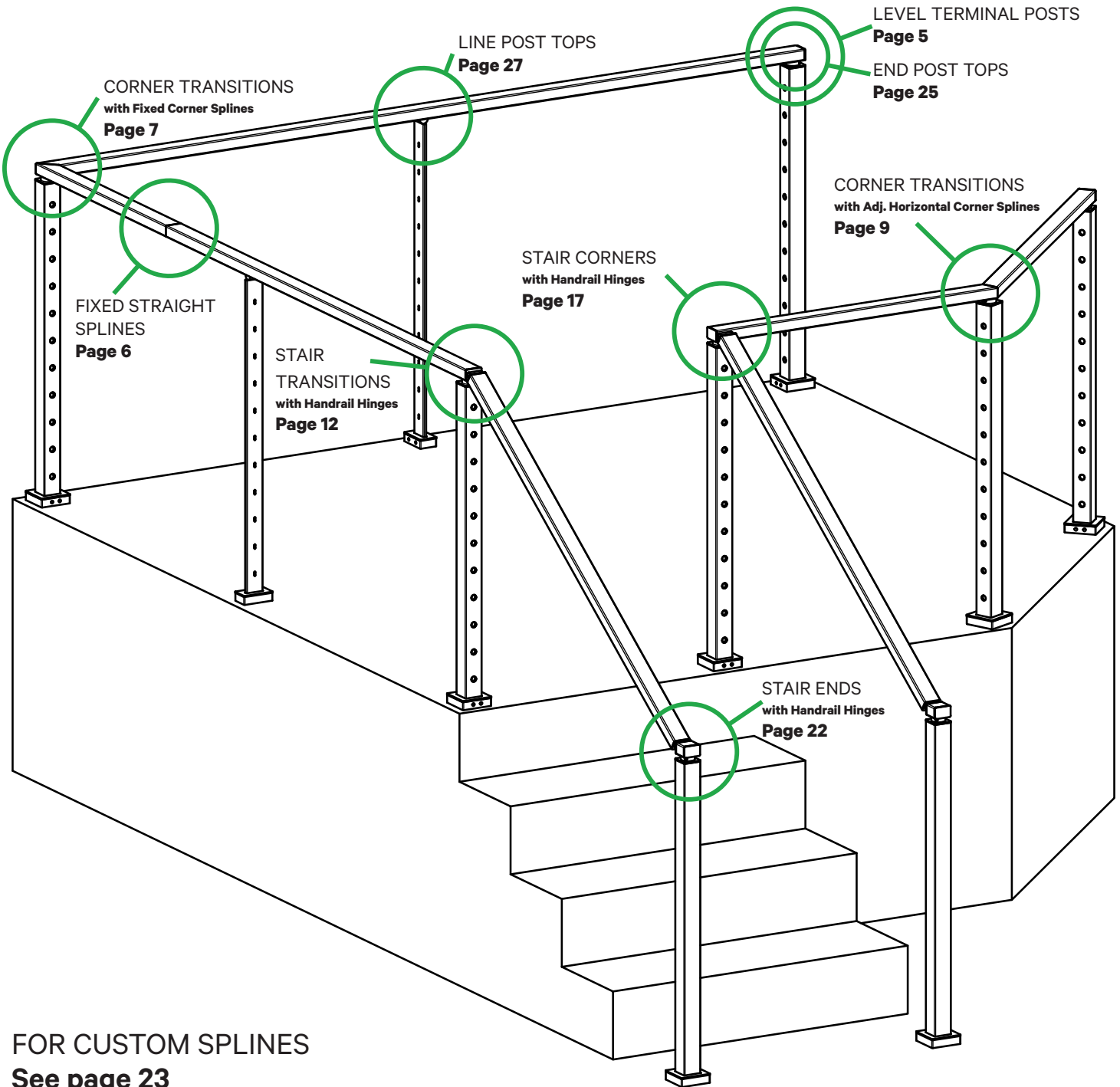


- 4 Certain sections may require multiple connections within a short span (under eight feet) and may need to be assembled as a unit before securing posts (**C**). This could be a short run with a corner or a stair transition. Assemble the whole unit and secure it to your posts all at one time. This will help you avoid removing anchoring screws in order to attach the end post tops.



- 5 When your entire railing is assembled, secure all end post top collars to center pins and check all line posts for secure handrail connections.

Connections Index

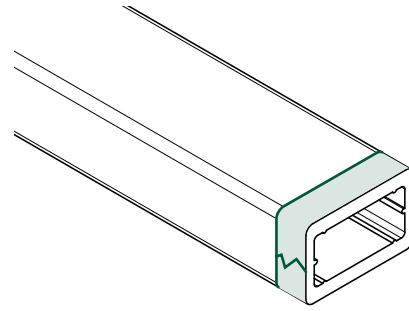
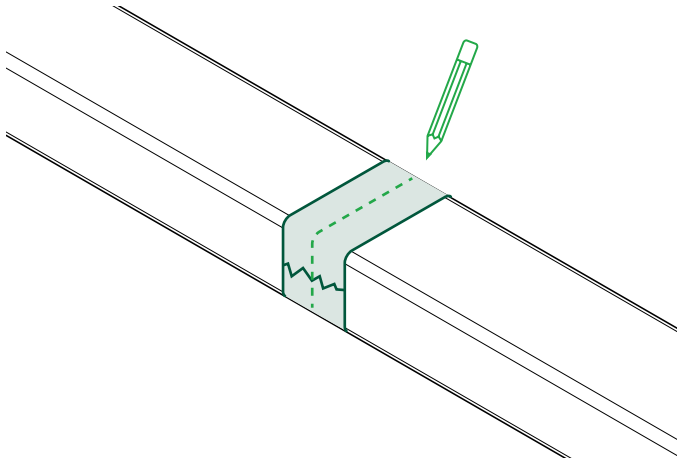


FOR CUSTOM SPLINES
See page 23

FOR INSTRUCTIONS ON
CUTTING HANDRAIL
See page 4

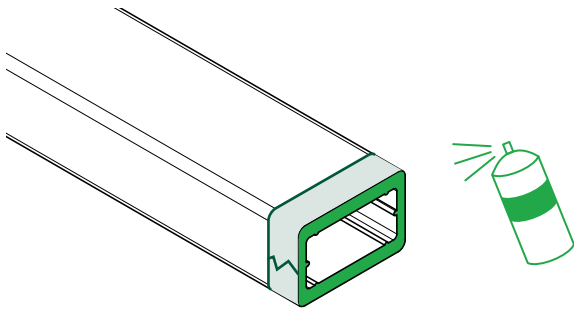
Cutting Handrail

Cleanly cut and touch-up handrail for invisible seams.



1 Apply painter's tape to your handrail to minimize chipping of the powder coat, and mark the cutting location and angle (if applicable).

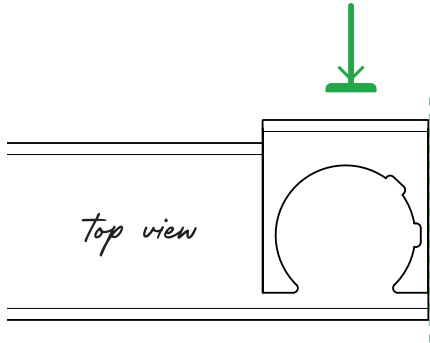
2 Cut your handrail using a miter saw with a non-ferrous metal cutting blade. File away any burrs.



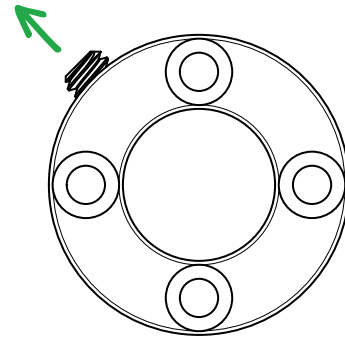
3 Before removing painter's tape, lightly spray your exposed ends with touch-up paint to cover any blemishes and minimize the appearance of seams. Remove the painter's tape.

Level Terminal Posts

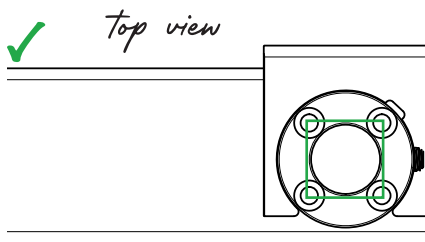
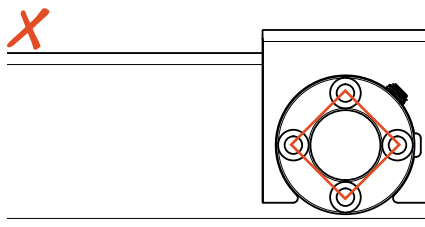
Connect your handrail to the first or last post on a level run.



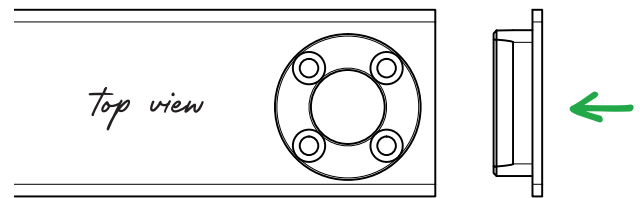
1 Find the location of your post top by aligning the edge of the Handrail Drill Guide and Template flush with the end of a piece of handrail and clamping it in place.



2 Back the set screw out of the post top collar using a 1/8" Allen wrench until it protrudes slightly. This will prevent the post top from rotating inside the template.



3 Insert the post top collar into the template and use the set screw cutouts to position the holes in a **square** formation rather than a diamond so you don't interfere with your end cap.

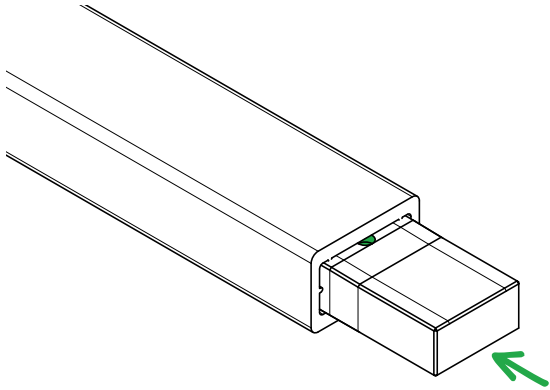


4 Continue to **End Post Tops** instructions on **page 25**.

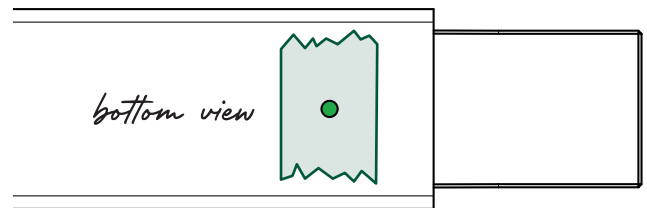
5 Slide in your end cap.

Fixed Straight Splines

Connect two lengths of handrail anywhere along a straight, continuous run with these structural, fixed straight splines. Wait to install the fixed straight spline immediately before a corner or stair transition until prompted.



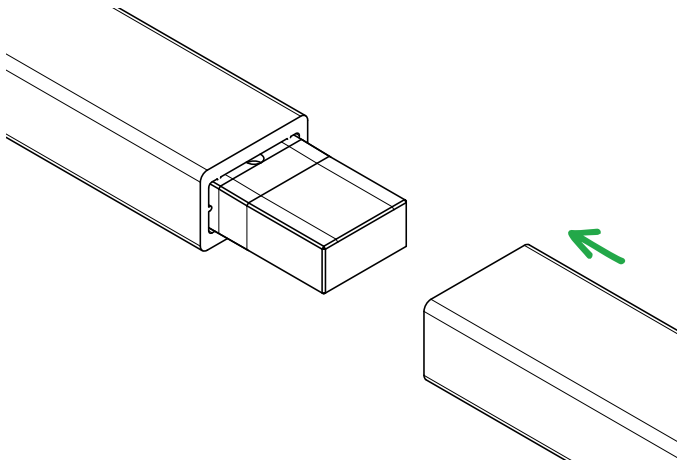
1 Slide a fixed straight spline into the end of your handrail that you need to continue until the dimple is flush with the end of the handrail. You may need to use a rubber mallet to gently tap the spline into place.



2 On the underside of the handrail, secure the spline by drilling a 1" deep pilot hole using a 5/32" drill bit. Tap the pilot hole using the 10-24 tap. Drive in a 10-24 x 1/2" set screw by hand using a 3/32" Allen wrench.



PRO TIP: Cover the handrail with painter's tape before drilling to minimize chipping of the powder coat.

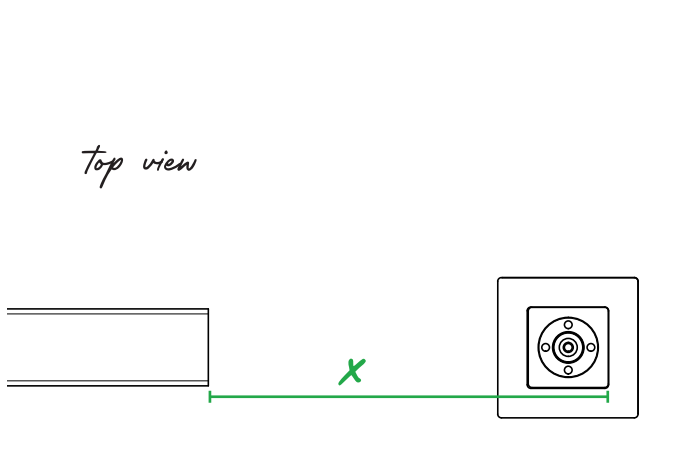


3 Slide a new length of handrail over the exposed end of the spline and repeat **step 2**.

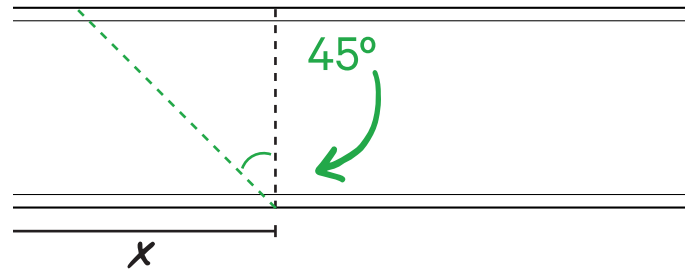
Corner Transitions

with Fixed Corner Splines

Turn your handrail at a 90° corner.

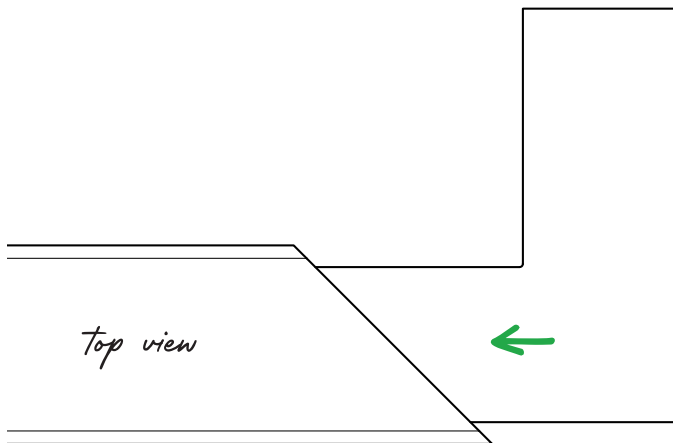


1 Find the length of your handrail by measuring to the far side of your corner post (x). Mark this length on a piece of handrail.

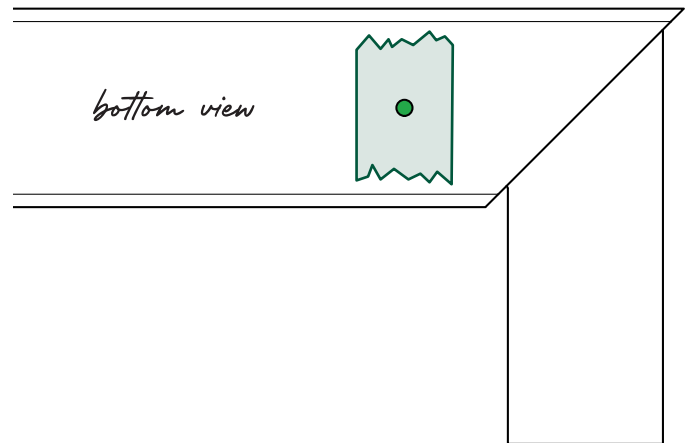


2 Based on this mark, use a speed square to draw a 45° angle for your miter cut.


3 Using instructions for **Cutting Handrail** on page **4** make your miter cut along this mark.



4 Slide a fixed corner spline into your mitered handrail. You may need to use a rubber mallet to gently tap the spline into place.

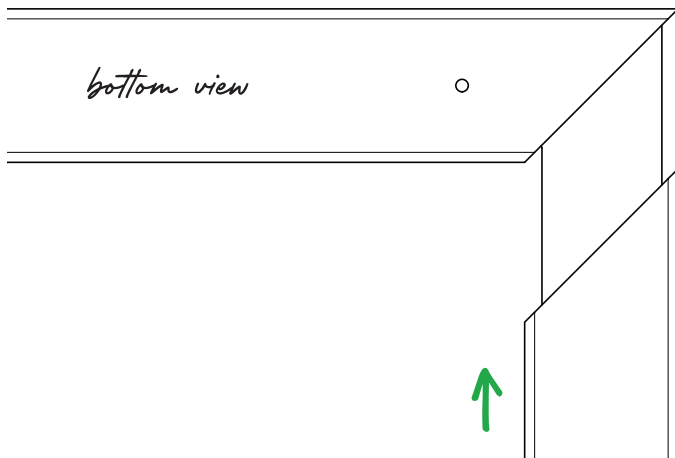


5 On the underside of the handrail, secure the spline by drilling a 1/2" deep pilot hole using a 5/32" drill bit. Tap the pilot hole using the 10-24 tap. Drive in a 10-24 x 1/2" set screw by hand using a 3/32" Allen wrench.

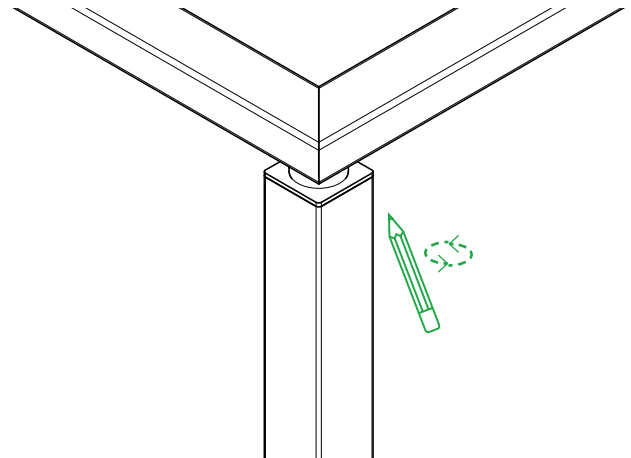
 **PRO TIP:** Cover the handrail with painter's tape before drilling to minimize chipping of the powder coat.

Corner Transitions

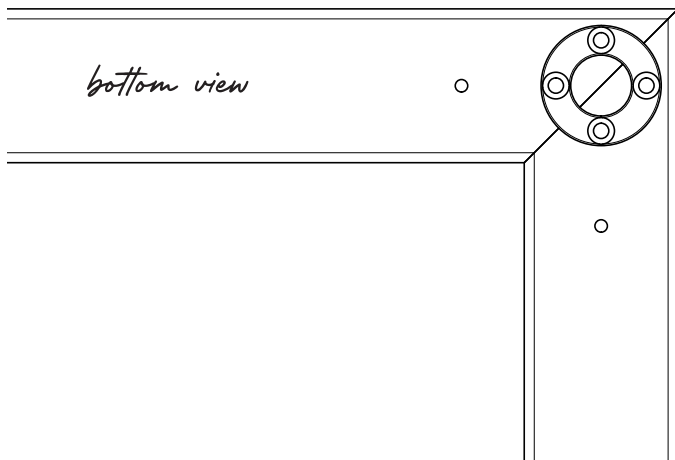
with Fixed Corner Splines



6 Flip the off-cut piece of handrail over and fit it to the installed spline to complete the corner. Secure by repeating **step 5**.



7 Align the handrail assembly on the post as it will be once installed and mark the location of the post top collar by tracing around it with a fine-point pencil.



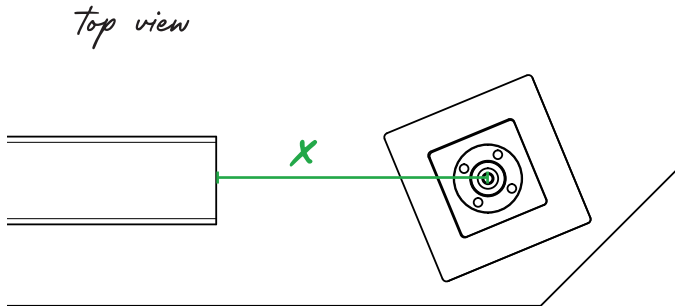
8 Remove your handrail and place it upside-down on your drilling surface. Attach the post top collar through the corner spline using the **End Post Tops** instructions on **page 25**. Make sure to drill your pilot holes deep enough into the spline to clear the 3/4" screws.

9 If necessary, use **Fixed Straight Spline** instructions on **page 6** to connect your corner to the previous handrail length.

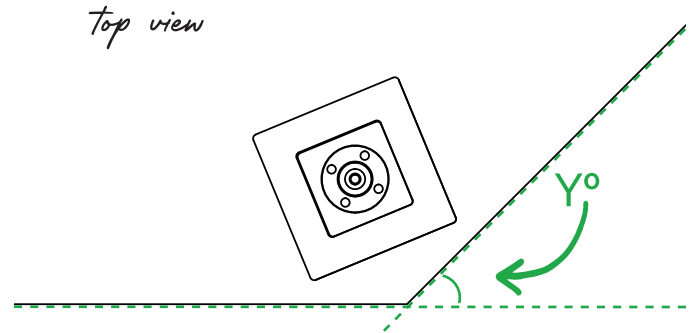
Corner Transitions

with Adjustable Horizontal Corner Splines

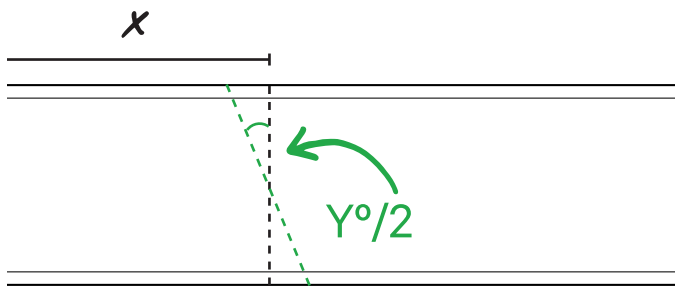
Turn your handrail at any obtuse corner (between 91°–179°.)



- 1 Find the length of your handrail by measuring to the center of the post top on the corner post (x). Mark this length on a piece of handrail.

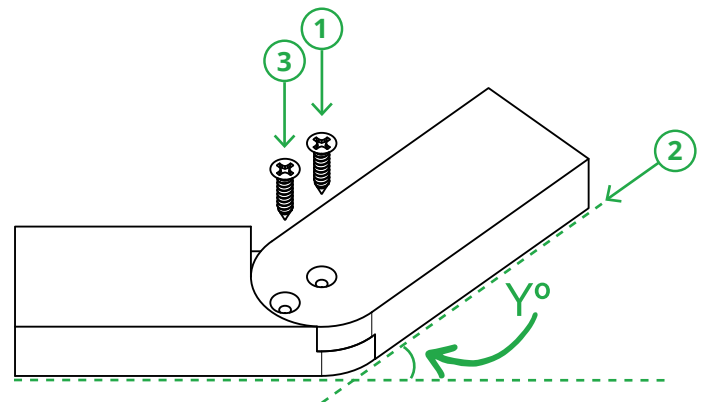


- 2 Determine the angle of your corner transition (Y°).



- 3 $Y^\circ/2$ will be the angle of your miter cut. Mark this angle on your handrail piece bi-secting the mark you made in **step 1**.

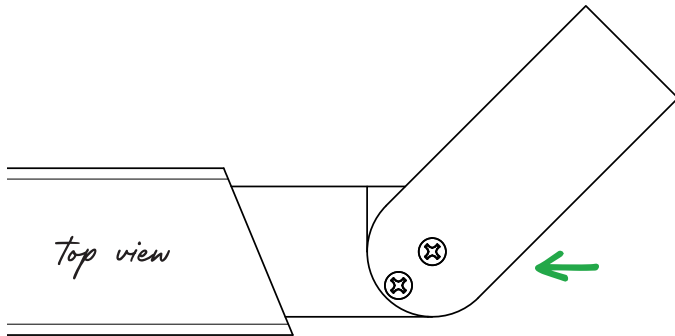
- 4 Using instructions for **Cutting Handrail** on **page 4** make your miter cut along this mark.



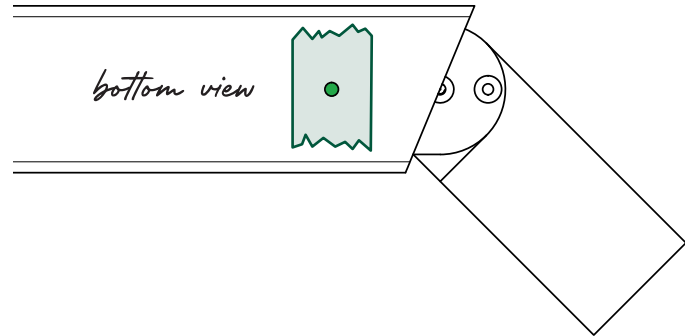
- 5 Assemble your adjustable horizontal corner spline using one of the included #8 x 3/4" pan head screws and a phillips head driver. Use an angle finder to set it to the angle of your corner transition (Y°), and lock it in place by driving the second #8 x 3/4" screw into one of the pre-drilled holes.

Corner Transitions

with Adjustable Horizontal Corner Splines



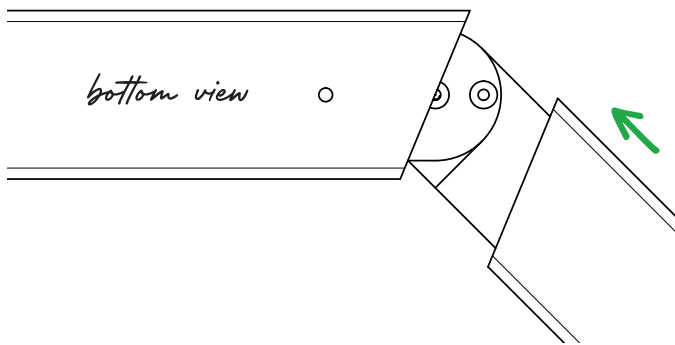
6 Slide the adjustable corner spline into your mitered handrail. You may need to use a rubber mallet to gently tap the spline into place.



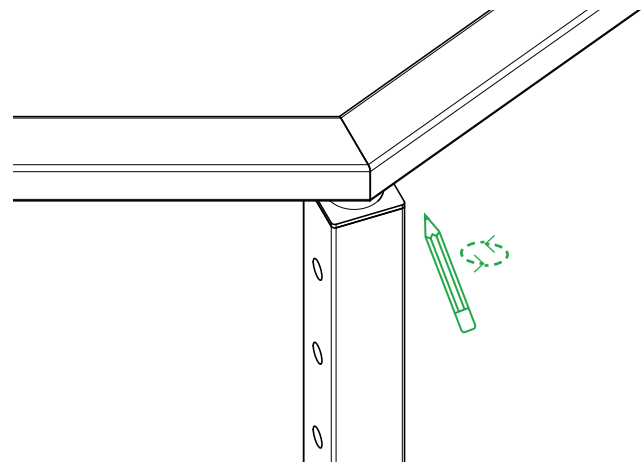
7 On the underside of the handrail, secure the spline by drilling a 1/2" deep pilot hole using a 5/32" drill bit. Tap the pilot hole using the 10-24 tap. Drive in a 10-24 x 1/2" set screw by hand using a 3/32" Allen wrench.



PRO TIP: Cover the handrail with painter's tape before drilling to minimize chipping of the powder coat.



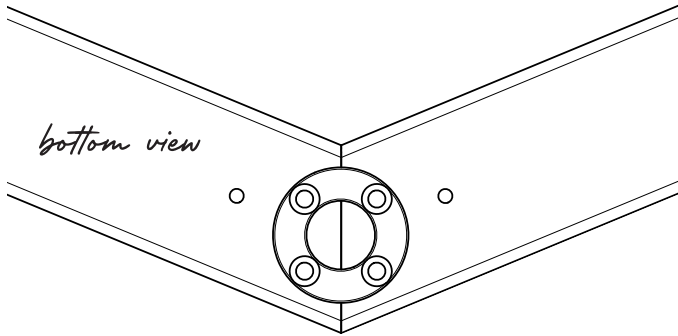
8 To complete your corner, flip the off-cut piece of handrail from your first miter cut over and fit it to the installed spline. If your off-cut piece is shorter than one foot, cut a fresh length of handrail at a matching angle to complete the transition. Secure by repeating **step 7**.



9 Align the handrail assembly on the post as it will be once installed and mark the location of the post top collar by tracing around it with a fine-point pencil.

Corner Transitions

with Adjustable Horizontal Corner Splines



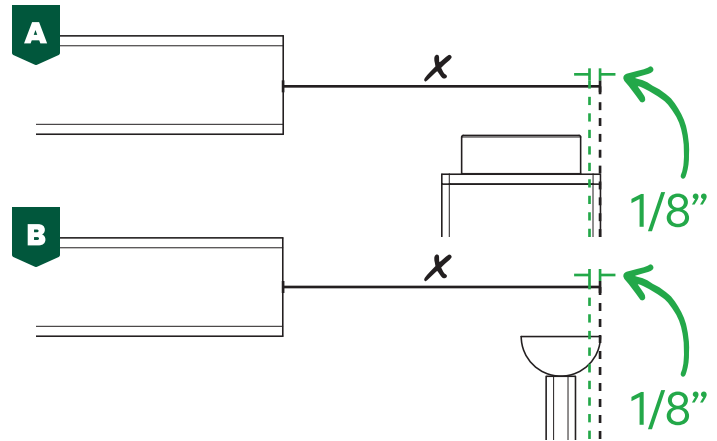
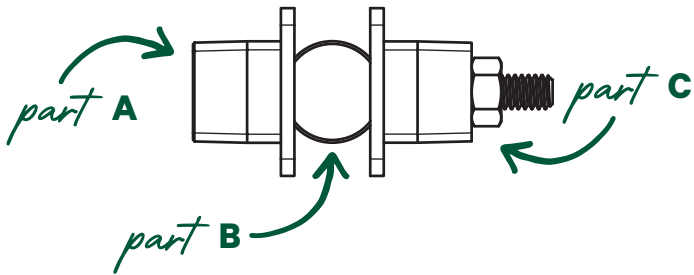
10 Remove your handrail and place it upside-down on your drilling surface. Attach the post top collar through the corner spline using the **End Post Tops** instructions on **page 25**. Make sure to drill your pilot holes deep enough into the spline to clear the 3/4" screws.

11 If necessary, use **Fixed Straight Spline** instructions on **page 6** to connect your corner to the previous handrail length.

Stair Transitions

with a Handrail Hinge

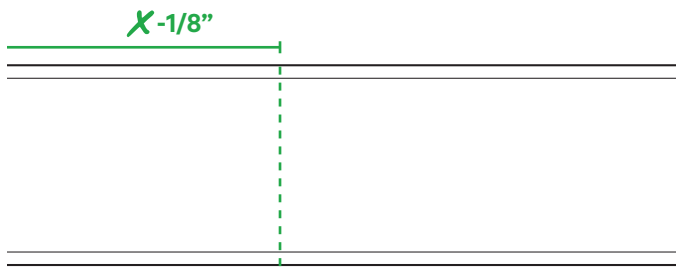
Transition your handrail up or down a set of stairs using a Handrail Hinge.



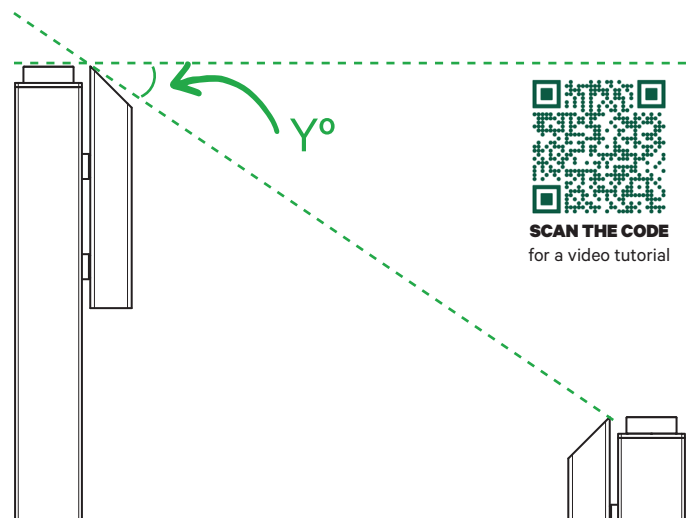
1 Working from the level section towards the stair transition, find the length of your handrail, and mark this length on a piece of handrail.

For an end post A: measure to the far side of your post (X). Subtract 1/8".

For a line post B: measure to the edge of the post top closest to the stairs (X). Subtract 1/8".



2 Using instructions for **Cutting Handrail** on **page 4**, make a straight cut at this location.



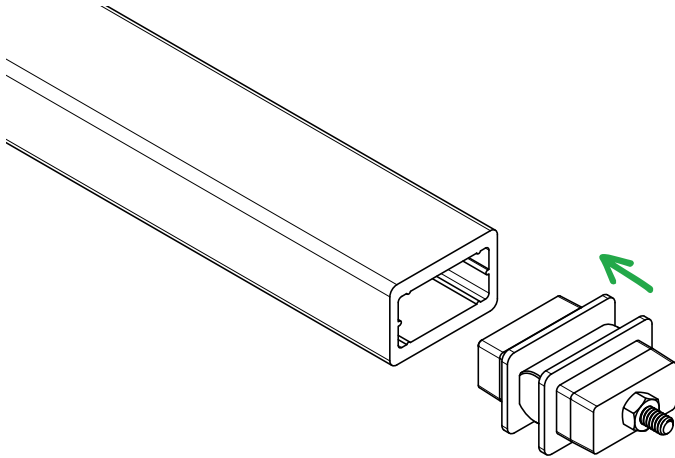
3 Determine the pitch of your stairs measuring from your cable inflection points (Y°). Make a note of this number—you will need it in a later step.



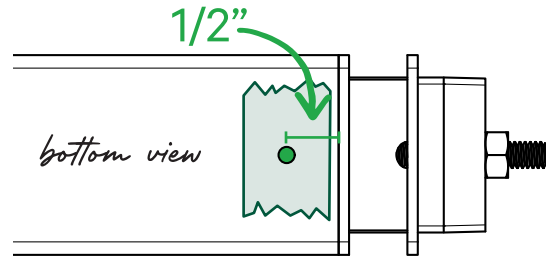
PRO TIP: Cut a piece of scrap handrail at a sharp angle and clamp it flush with the inflection point and level with the post top to create a precise point to measure from.

Stair Transitions

with a Handrail Hinge



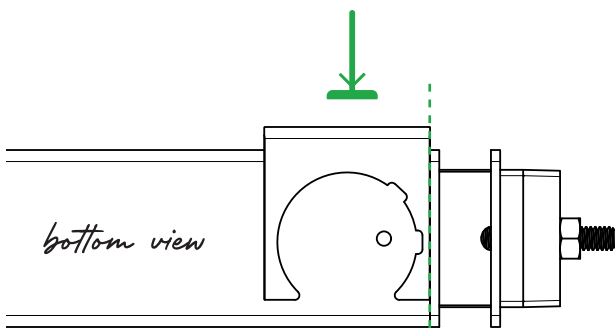
4 Set your Handrail Hinge straight (180°) and lock it in place by tightening the nut using a 7/16" socket or wrench. Slide part A into your handrail making sure the hinge pivots in the proper direction. The nut should be accessible. You may need to use a rubber mallet to gently tap the hinge into place.



5 On the underside of the handrail, secure the hinge by drilling a 1" deep pilot hole 1/2" from the cut of the handrail using a 5/32" drill bit. Tap the pilot hole using the 10-24 tap. Drive in a 10-24 x 1/2" set screw by hand using a 3/32" Allen wrench.

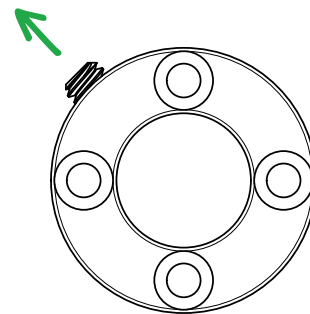


PRO TIP: cover the handrail with painter's tape before drilling to minimize chipping the powder coat.



6 For an end post: Find the location of your post top by aligning the edge of the Handrail Drill Guide and Template flush with the cut of a piece of handrail. Clamp in place.

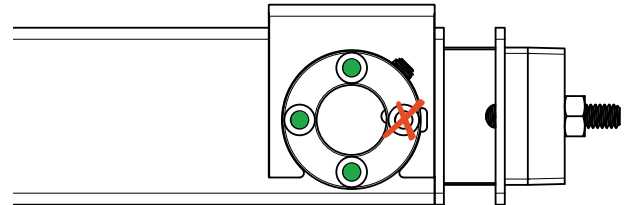
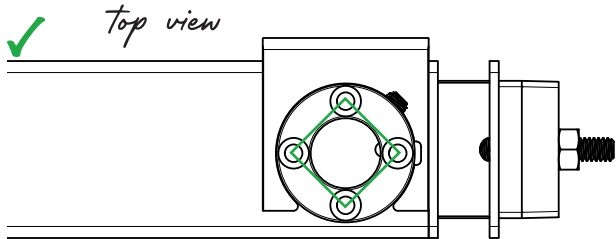
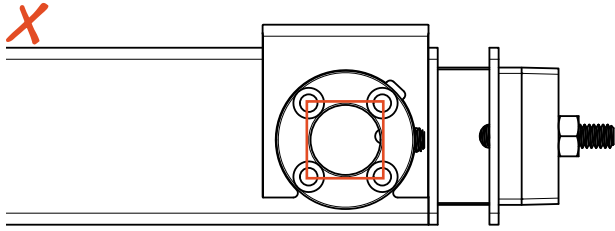
For a line post: go to **step 10.**



7 Back the set screw out of the post top collar using a 1/8" Allen wrench until it protrudes slightly. This will prevent the post top from rotating inside the template.

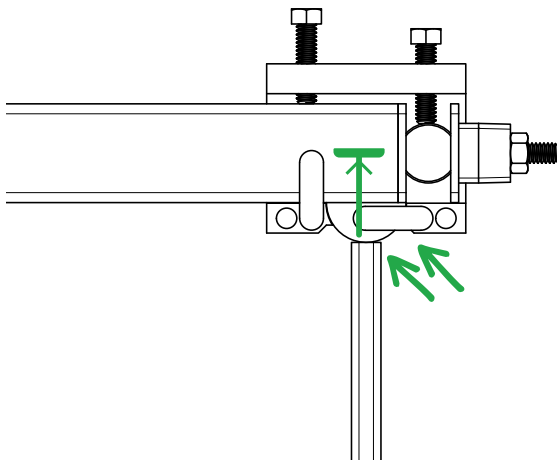
Stair Transitions

with a Handrail Hinge



8 Insert the post top collar into the drill guide and use the set screw cutouts to position the holes in a **diamond** formation rather than a square so you don't interfere with your hinge plug.

9 Continue to **End Post Tops** instructions on **page 25**, but secure the post top with only 3 screws as the hinge set screw will be partially blocking one of the post top holes.

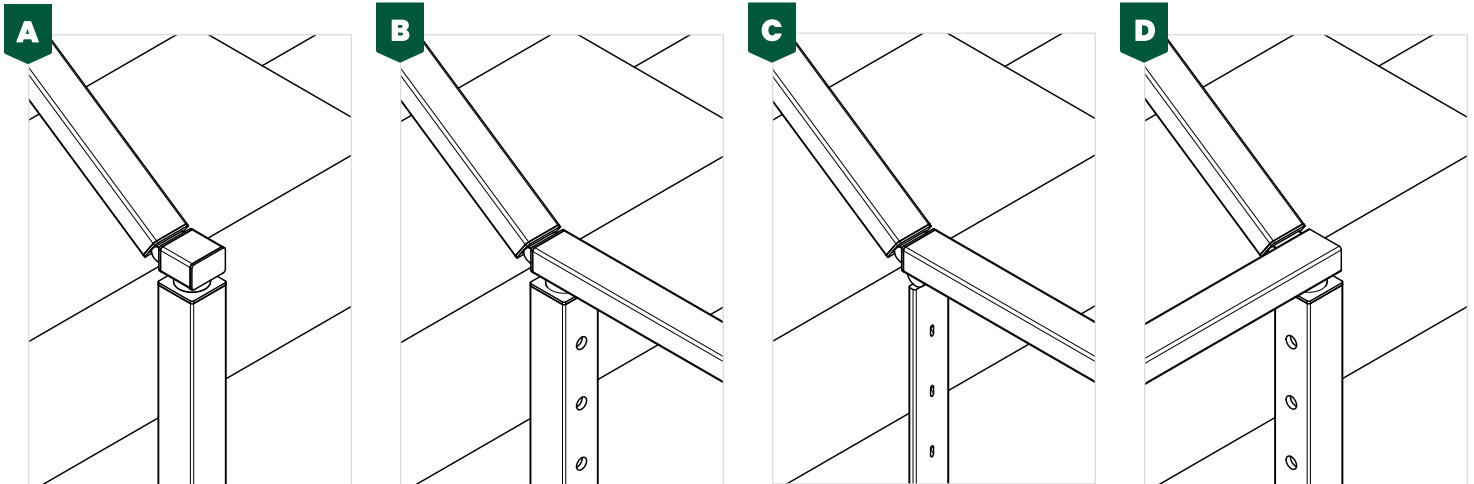


10 **For a line post:** position the post top so the screws will face away from the stairs, and replace your handrail back on your posts. (If necessary, use **Fixed Straight Spline** instructions on **page 6** to connect your handrail to the previous handrail length.)

Secure your handrail using the Handrail Clamp for Line Posts. Use an additional clamp to ensure the handrail is snug. Follow **Line Post Tops** instructions on **page 27** to drill, tap, and secure handrail to the post through the Handrail Hinge. Make sure to drill your pilot holes deep enough to clear the 3/4" screws.

Stair Transitions

with a Handrail Hinge



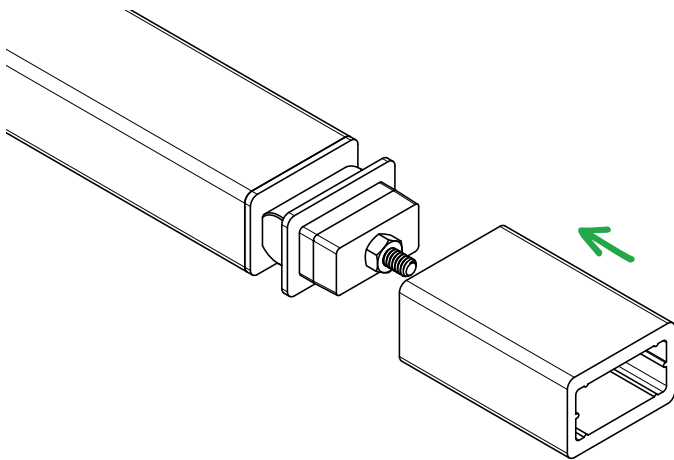
11 If your stairs end your run, construct a **Stair End with a Handrail Hinge (A)** by following the instructions on **page 22**.

12 If your stairs continue into level runs on both ends, follow the appropriate instructions for your transition: In all cases, *do not attach this handrail segment to your post yet*—you will need to be able to maneuver it in order to assemble your complete run.

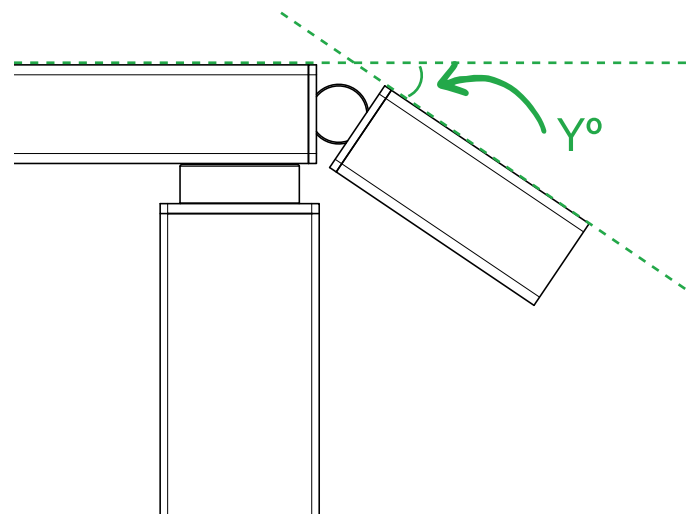
Straight end post B: repeat **steps 4–9** of this section (**pages 13–14**)

Straight line post C: repeat **steps 4–5** of this section (**page 13**)

Corner D: perform **steps 4–7** and **9–12** of *Stair Corners with a Handrail Hinge* section (**pages 18 and 19**)



13 Loosen the nut on one of the Handrail Hinges slightly to allow for adjustment, and take a piece of scrap handrail material and insert it over hinge part C. This will serve as a placeholder when setting the angle.



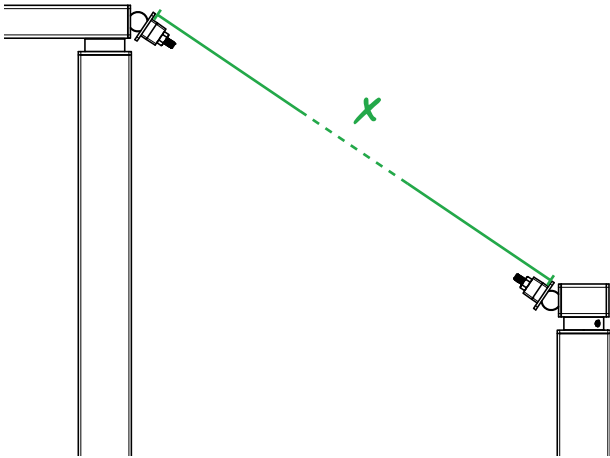
14 Set the Handrail Hinge to the pitch of your stairs (found in **step 3**). Carefully slip off the scrap handrail so you don't disrupt the angle of your hinge, and tighten the nut on the hinge using a 7/16" socket or wrench to lock the angle in place.



PRO TIP: Use a socket with an extension to set the nut without having to remove the scrap handrail and risk disrupting the hinge angle.

Stair Transitions

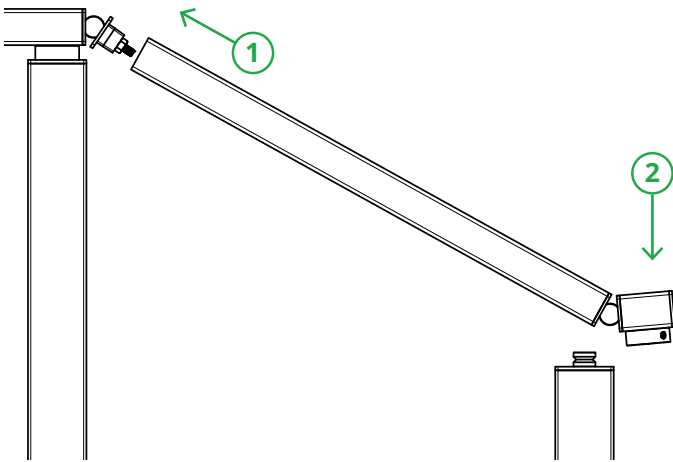
with a Handrail Hinge



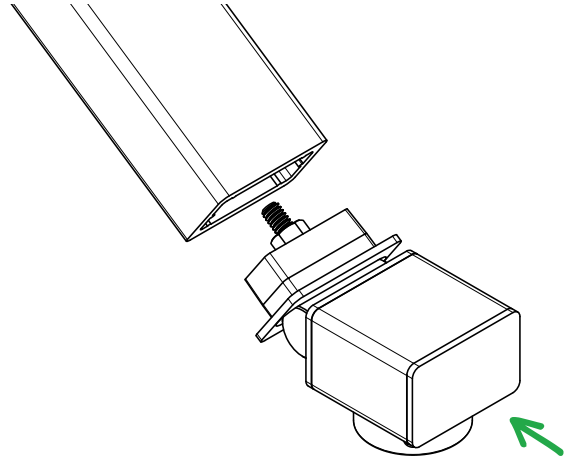
15 Repeat **steps 13** and **14** on the hinge at the other end of your stair run.

16 Find the length of your stair handrail segment by measuring the distance between the inside rims of each exposed hinge plug. Cut a piece of handrail to this length.

You may need to spline additional lengths of handrail together using a fixed straight spline (**page 6**) in order to reach the end of your stair run.



18 Slide this handrail and stair end assembly onto the Handrail Hinge at the other side of the run and lock it in place by fitting the stair end post top collar onto the center pin.



17 Slide one end of this piece of handrail over hinge part C of the stair end.



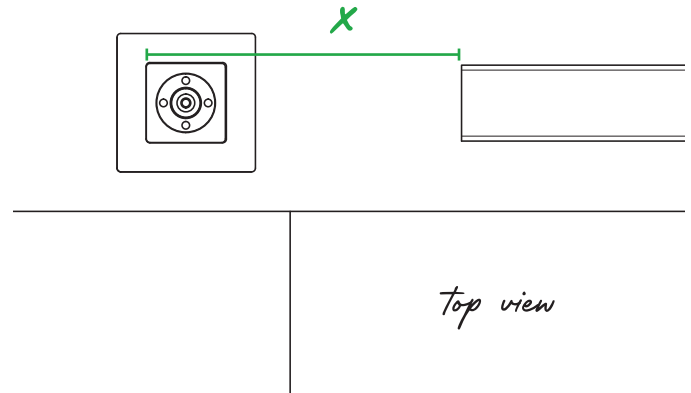
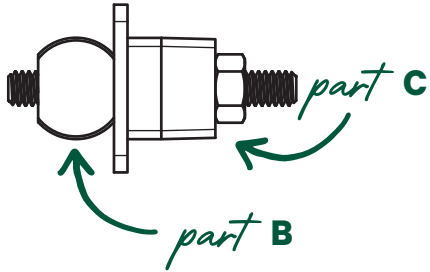
PRO TIP: If you need more stability in your connection, you can install a set screw underneath or into the side of your handrail here the same as you did in **step 5**.

19 Secure all post tops along your stair run by driving in end post set screws and following instructions for securing **Line Post Tops** on **page 27**.

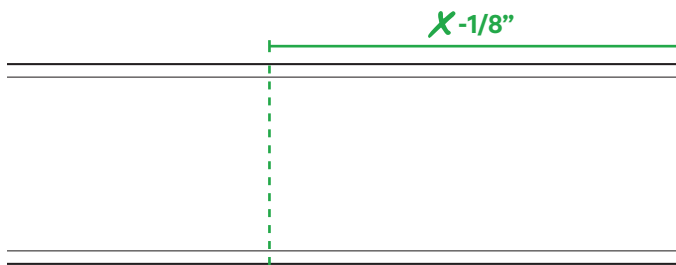
Stair Corners

with Handrail Hinges

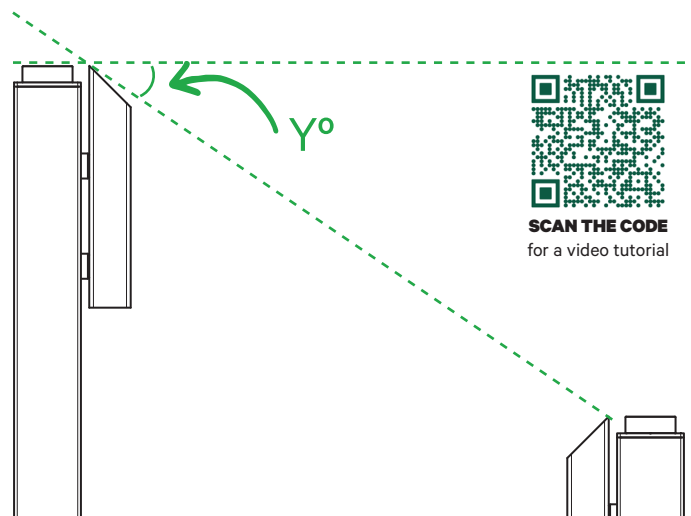
Transition your handrail around a 90° corner and immediately up or down a set of stairs using a Handrail Hinge.



- 1 Working from the level section towards the stair transition, find the length of your handrail by measuring to the far side of your corner post (X). Subtract 1/8". Mark this length on a piece of handrail.



- 2 Using instructions for **Cutting Handrail** on page 4, make a straight cut at this location.

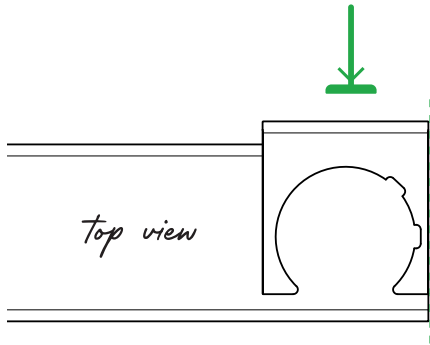


- 3 Determine the pitch of your stairs measuring from your cable inflection points (Y°). Make a note of this number—you will need it in a later step.

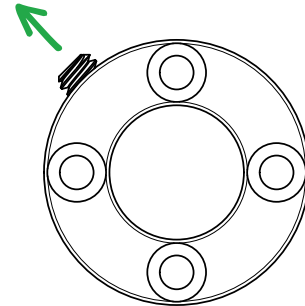
PRO TIP: Cut a piece of scrap handrail at a sharp angle and clamp it flush with the inflection point and level with the post top to create a precise point to measure from.

Stair Corners

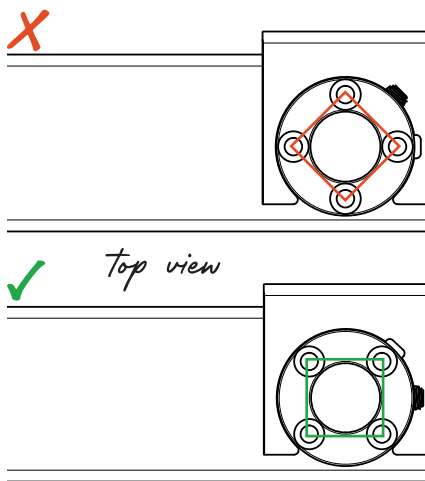
with Handrail Hinges



4 Find the location of your post top by aligning the edge of the Handrail Drill Guide and Template flush with the end of your piece of handrail and clamping it in place.

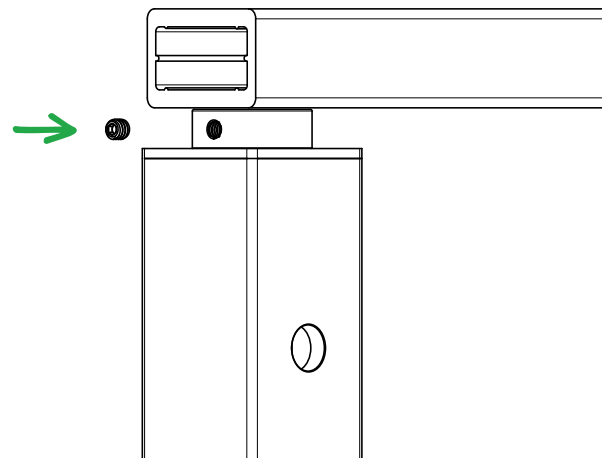


5 Back the set screw out of the post top collar using a 1/8" Allen wrench until it protrudes slightly. This will prevent the post top from rotating inside the template.



6 Insert the post top collar into the template and use the set screw cutouts to position the holes in a **square** formation rather than a diamond so you don't interfere with your end cap.

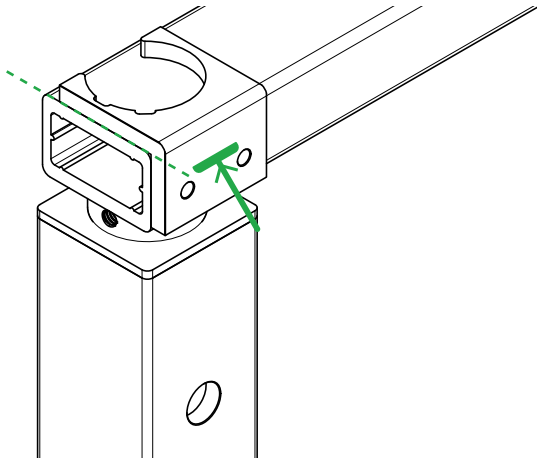
7 Continue to **End Post Tops** instructions on **page 25**. Do not install your end cap yet.



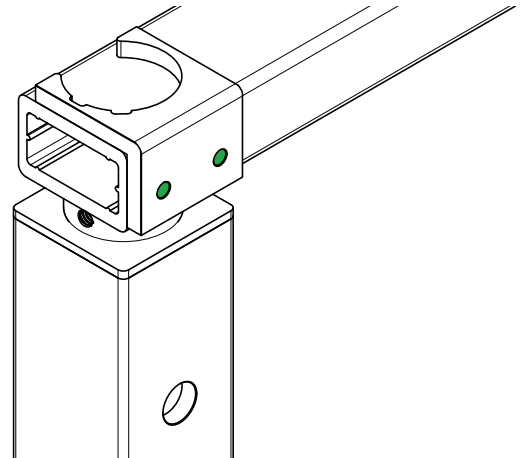
8 If necessary, use **Fixed Straight Spline** instructions on **page 6** to connect your handrail assembly to the previous handrail length. Secure your post top to the post by driving in the set screw with a 1/8" Allen wrench.

Stair Corners

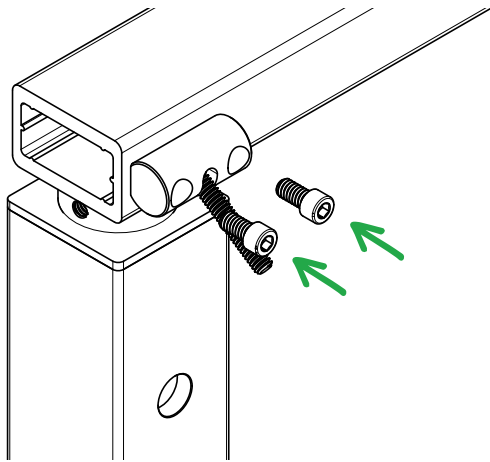
with Handrail Hinges



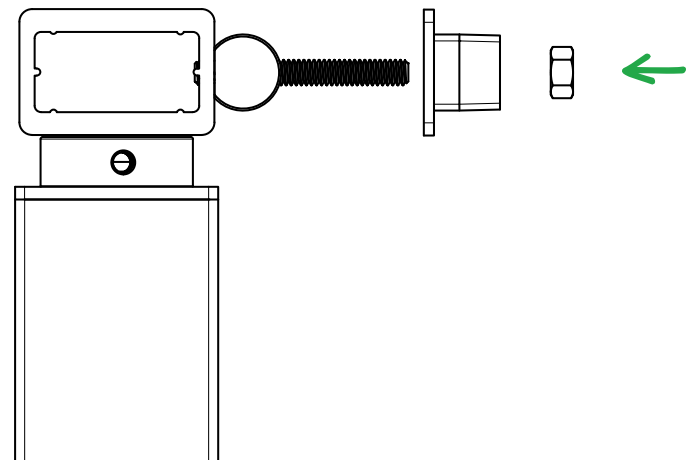
9 Find the location of the Handrail Hinge by clamping the drill guide to the stair-facing side of your handrail with the edge flush with your straight cut and the post top template sitting on top of the handrail.



10 Drill the two pilot holes through the drill guide using a 7/32" drill bit. Tap both holes using a 1/4-20 tap.

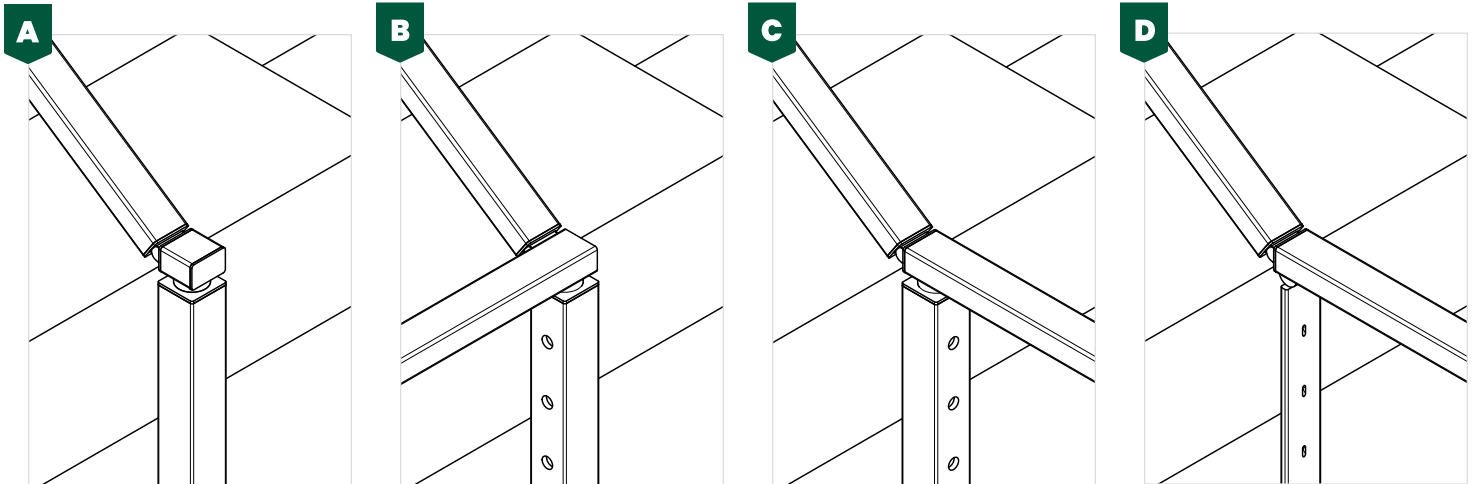


11 Align the flat side of hinge part B to the side of your post making sure the protruding screw pivots in the correct direction. Attach by driving in the two 1/4-20 x 1/2" socket head cap screws using a 3/16" Allen wrench.



12 Insert the pivoting screw into hinge part C so that part B fits into the curved bed. Secure loosely with the nut.

Stair Corners with Handrail Hinges



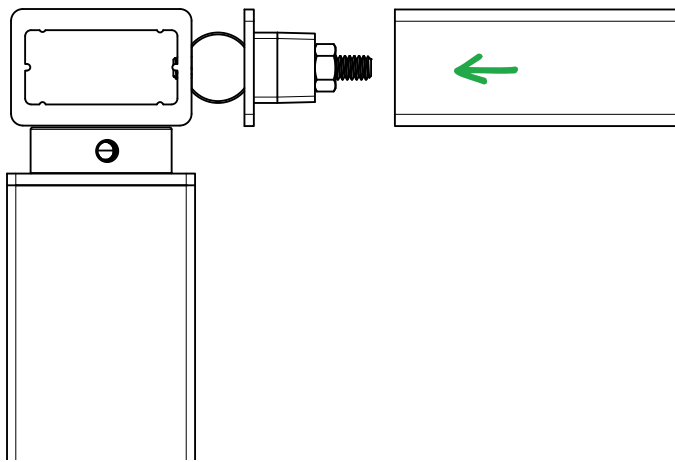
13 If your stairs end your run, construct a **Stair End with a Handrail Hinge (A)** by following the instructions on **page 22**.

14 If your stairs continue into level runs on both ends, follow the appropriate instructions for your transition: In all cases, *do not attach this handrail segment to your post yet*—you will need to be able to maneuver it in order to assemble your complete run.

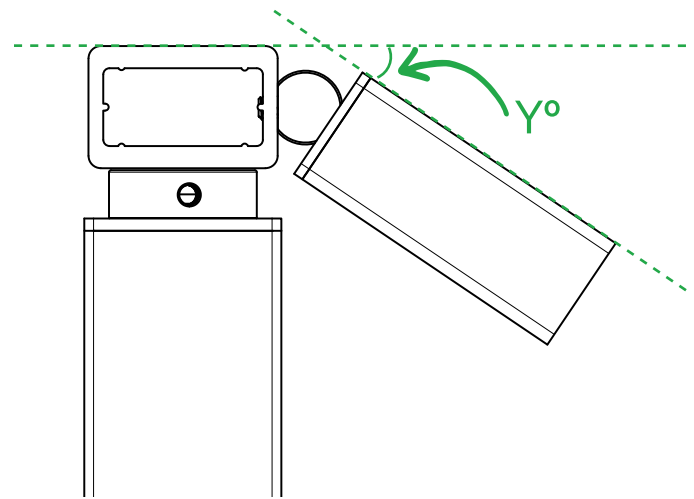
Corner B: repeat **steps 4–7** and **9–12** of this section (**pages 18** and **19**)

Straight end post C: perform **steps 4–9** of *Stair Transitions with a Handrail Hinge* section (**pages 13–14**)

Straight line post D: perform **steps 4–5** of *Stair Transitions with a Handrail Hinge* section (**page 13**)



15 Loosen the nut on one of the Handrail Hinges slightly to allow for adjustment, and take a piece of scrap handrail material and insert it over hinge part C. This will serve as a placeholder when setting the angle.



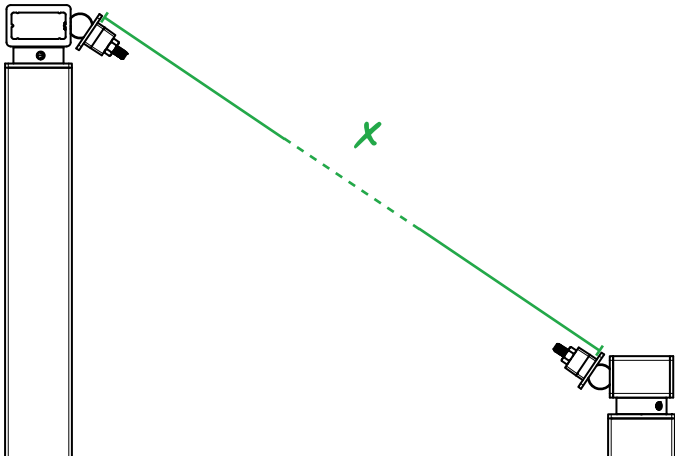
16 Set the Handrail Hinge to the pitch of your stairs (found in **step 3**). Carefully slip off the scrap handrail so you don't disrupt the angle of your hinge, and tighten the nut on the hinge using a 7/16" socket or wrench to lock the angle in place.



PRO TIP: Use a socket with an extension to set the nut without having to remove the scrap handrail and risk disrupting the hinge angle.

Stair Corners

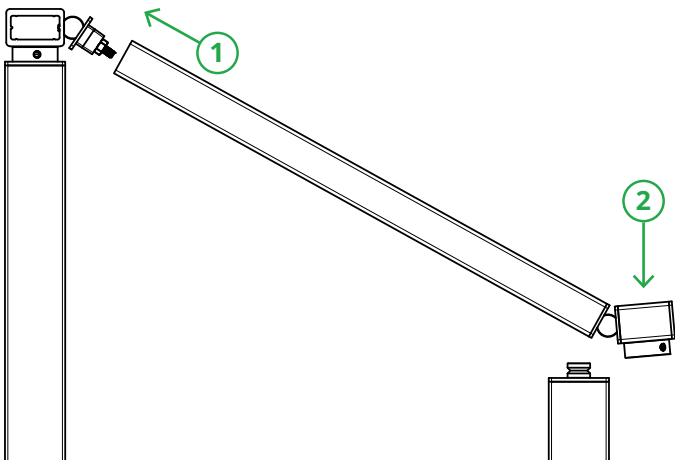
with Handrail Hinges



17 Repeat **steps 15** and **16** on the hinge at the other end of your stair run.

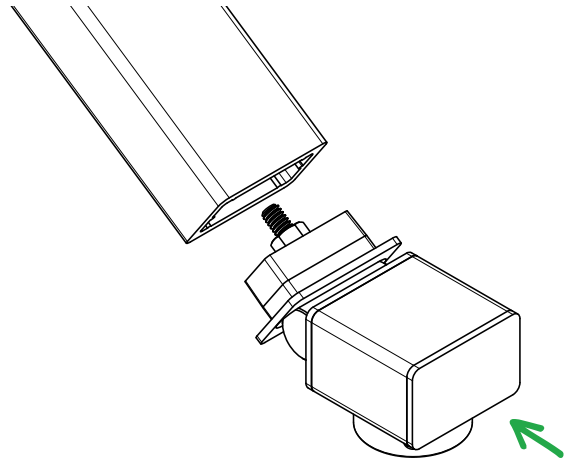
18 Find the length of your stair handrail segment by measuring the distance between the inside rims of each exposed hinge plug. Cut a piece of handrail to this length.

You may need to spline additional lengths of handrail together using a fixed straight spline (**page 6**) in order to reach the end of your stair run.



20 Slide this handrail and stair end assembly onto the Handrail Hinge at the other side of the run and lock it in place by fitting the stair end post top collar onto the center pin.

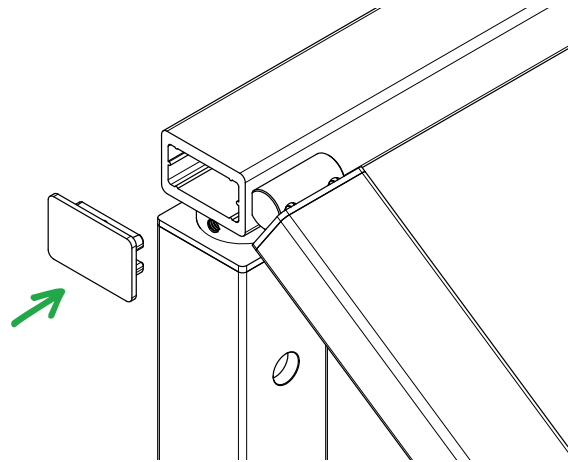
21 Secure all post tops along your stair run by driving in end post set screws and following instructions for securing **Line Post Tops** on **page 27**.



19 Slide one end of this piece of handrail over hinge part C of the stair end.



PRO TIP: If you need more stability in your connection, you can install a set screw underneath or into the side of your handrail here by drilling a 5/32" hole 1" deep, tapping it with the 10-24 tap, and driving in a 10-24 x 1/2" set screw using a 3/32" Allen wrench.

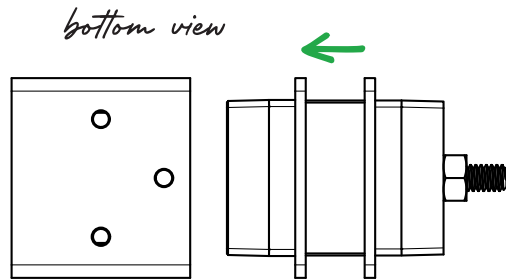


22 Slide in the end cap at your corner hinge making sure the notch accommodates the screw holding the hinge to the side of the handrail.

Stair Ends

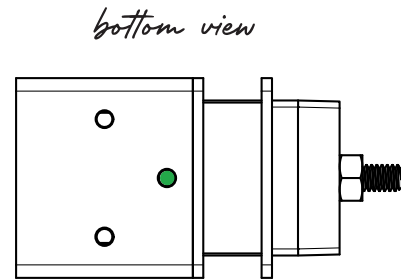
with Handrail Hinges

Terminate your handrail over the final end post of a stair run where the handrail does not continue into a level run using a Handrail Hinge. This can occur at either the top or bottom of the stair depending on your project.



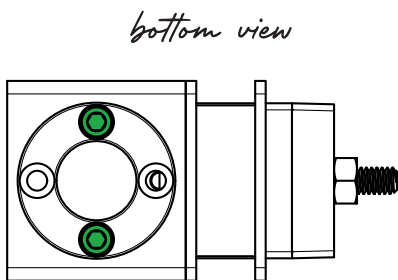
- 1 Set a Handrail Hinge straight (180°) and lock it in place by tightening the nut using a 7/16" socket or wrench.

Slide hinge part A into the pre-cut and drilled stair end making sure the hinge pivots in the proper direction and the pre-drilled (un-threaded) hole overlaps the plug of the hinge. The nut should be accessible.

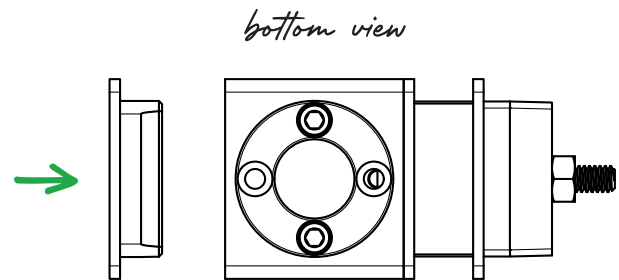


- 2 Secure the hinge by extending the pilot hole into the hinge plug using a 5/32" drill bit. Make sure to drill your pilot holes 1" deep into the handrail. Tap the pilot hole using the 10-24 tap.

- 3 Drive in a 10-24 x 1/2" set screw by hand using a 3/32 Allen wrench.



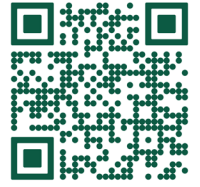
- 4 Attach the post top collar to the stair end by driving two handrail mounting screws into the two pre-tapped holes using a 5/32" driver.



- 5 Slide an end cap into the other end of the stair end. It should fit snugly and does not need to be secured into place.

Custom Splines

Build custom splines to connect handrail at any non-standard corner and/or vertical transitions.



SCAN THE CODE
for a video tutorial

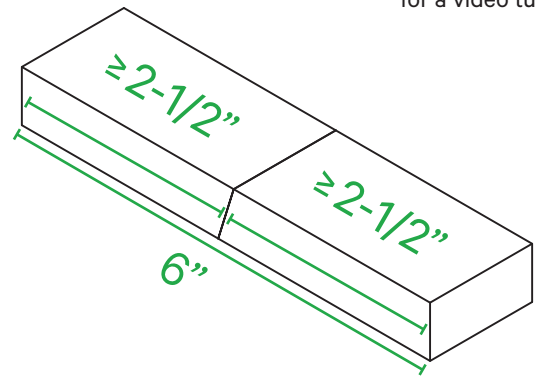
tools

- ❑ 3/8" drill bit
- ❑ 5/32" drill bit*
- ❑ 1/8" drill bit
- ❑ Quick clamps
- ❑ Tape measure

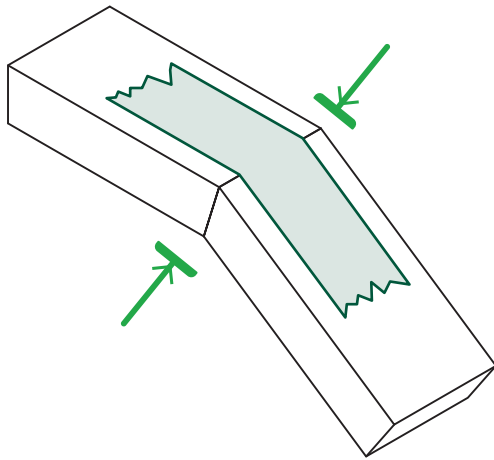
(Drill bit sizes may vary based on your screws)

supplies

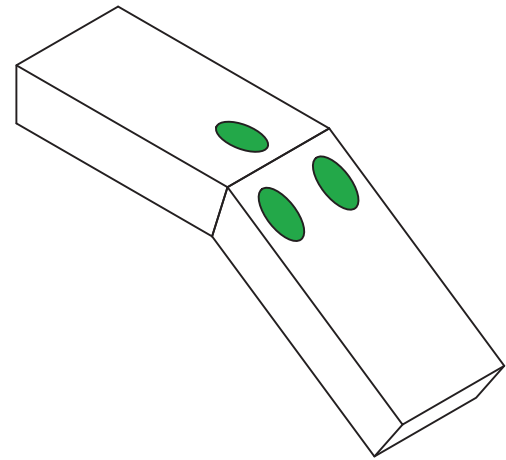
- ❑ 2-1/2" deck screws
 - ❑ Spline Stock*
 - ❑ High-tack painter's tape
- *available at cablebullet.com



- 1 Cut a length of spline stock at least 6" long (or longer if your spline requires).
- 2 Cut this piece of spline stock in half with a bevel or miter cut (depending on your transition) that is half of the total angle of your transition ($Y^\circ/2$). Make sure that there is at least 2-1/2" of material on both halves to accommodate 2-1/2" screws.



- 3 Flip over one of the halves and secure the two pieces together tightly using high-tack tape on the top and the bottom. Clamp the seam to keep the pieces from sliding side-to-side.

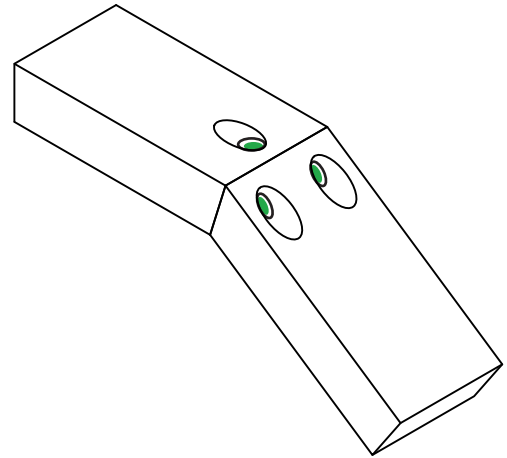
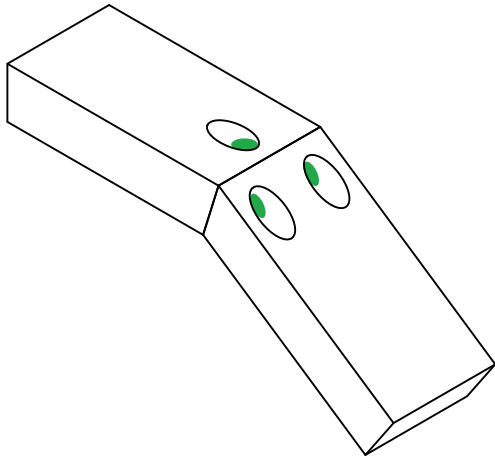


- 4 Using a 3/8" drill bit (or appropriate), create three counter sink holes on the spline. These will house the head of the screws. Drill your holes as high as possible to maximize engagement on both sides of the spline.




PRO TIP: begin your counter sink holes by drilling perpendicular to the surface of your spline. Once you have traction, transition to drilling parallel with the opposite side.

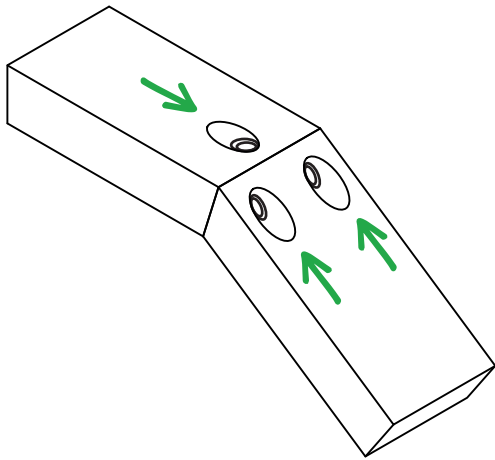
Custom Splines



5 Check that nothing has shifted, and adjust as necessary. Switch to a 5/32" drill bit (or appropriate). Drill into each counter sunk pocket parallel with the opposite side and deep enough to accommodate the unthreaded shank of your screws.

 **PRO TIP:** when you need to drill to a certain depth, use tape to mark that depth on your drill bit.

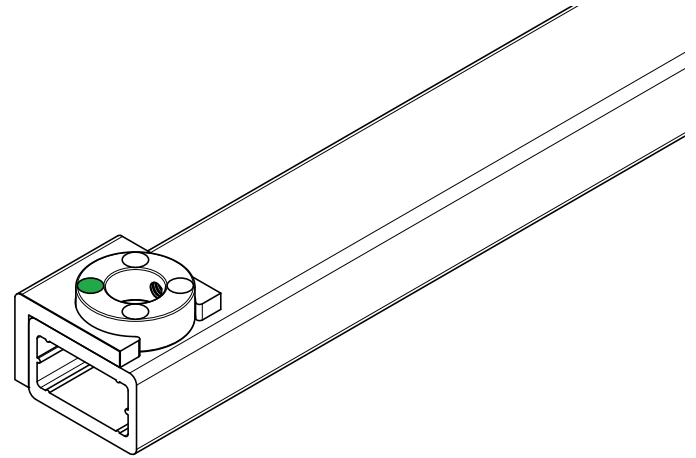
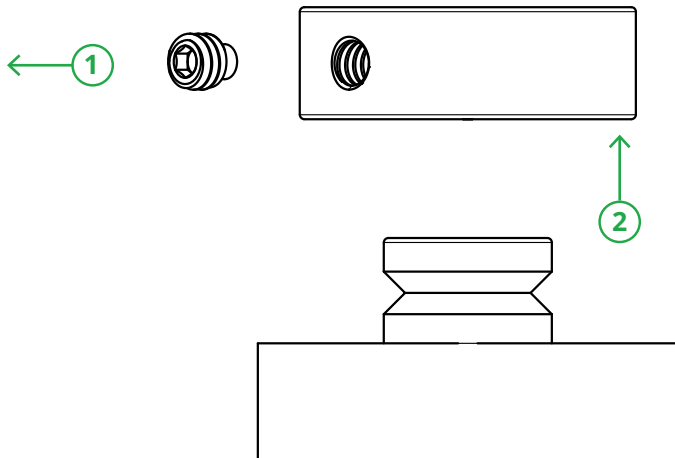
6 Finally, use a 1/8" bit (or appropriate) to drill 2-1/2" deep through the joint and into the opposite half of the spline.



7 Drive in three 2-1/2" deck screws. Unclamp and remove the tape.

End Post Tops

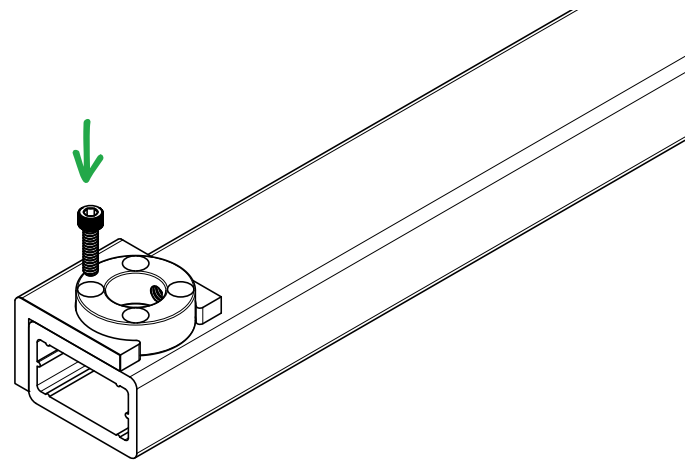
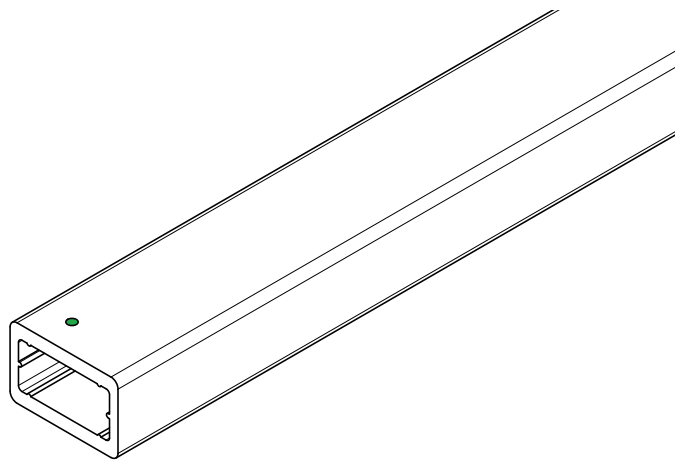
Attach handrail to end posts.



HOW TO REMOVE MODERN TOP COLLAR:

- 1 Loosen the set screw with a 1/8" Allen wrench.
- 2 Lift the outer collar from the center pin.

- 1 Mark the location of the first screw hole using a 11/64" drill bit then remove the post top collar.



- 2 Drill a pilot hole using the 11/64" bit. If your post top will be installed into an aluminum spline, drill 1" deep and tap the pilot hole using the 10-24 tap. If it will be installed into a delrin spline or without a spline, drill 1/2" deep.

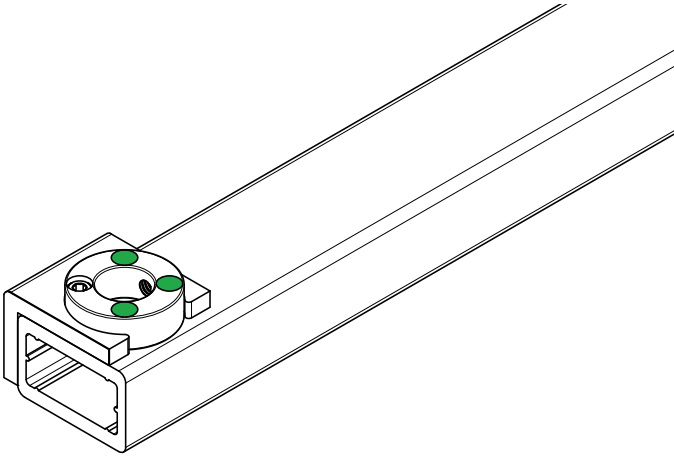
- 3 Replace the post top collar into the template and secure it to the handrail using a Signature Series Handrail Mounting Screw and a 5/32" driver.

PRO TIPS:



- If needed, a 5/32" drill bit can be used with handrail mounting screws, just make sure to tap each hole using the 10-24 tap to avoid breaking your screws.
- Use machine oil, blow out each hole with canned air, and tap a second time for a cleaner tap.

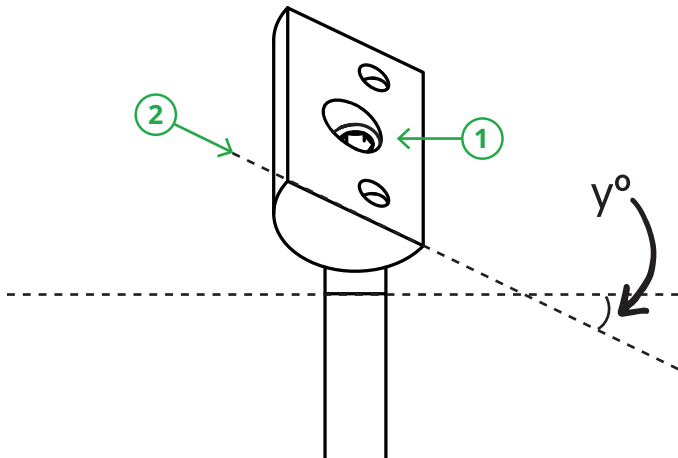
End Post Tops



- 4** Repeat **steps 2–3** on the remaining three post top collar holes.
- 5** At the appropriate time, secure the post top collar to the center pin by re-tightening the set screw using a 1/8" Allen wrench.

Line Post Tops

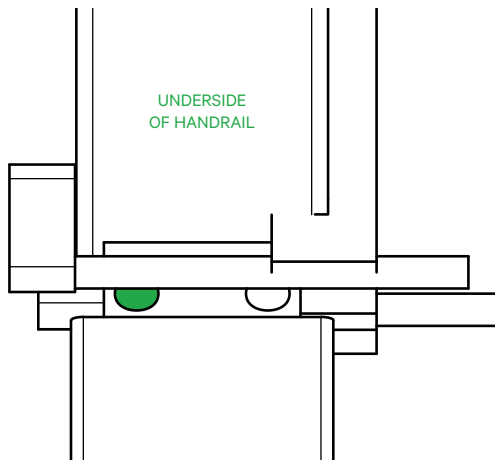
Attach handrail to both level and stair line posts.



HOW TO ADJUST THE ANGLE OF THE POST TOP ON STAIR RUNS:

1 Loosen the post top using a 3/16" Allen wrench.

2 Use an angle finder to adjust the angle of the post to match the pitch of your stairs (y°), and tighten the screw to lock the angle in place.

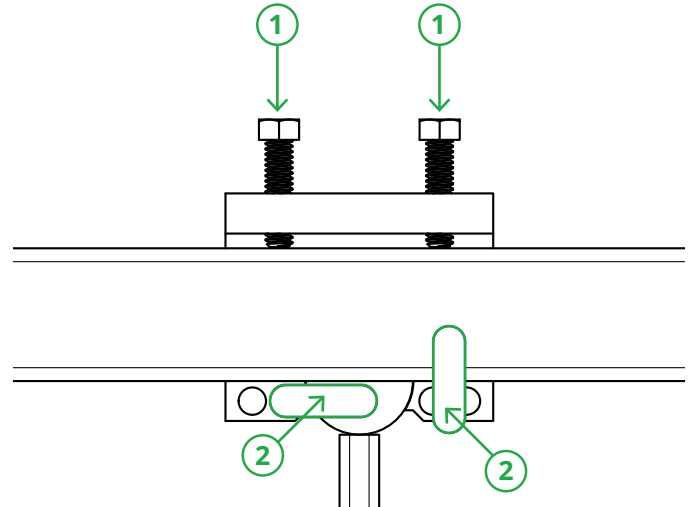


2 Using the 11/64" drill bit, drill the handrail through one of the post top holes. If your post top will be installed into an aluminum spline, drill 1" deep. If it will be installed into a delrin spline or without a spline, drill 1/2" deep. Tap the pilot hole using the 10-24 tap.

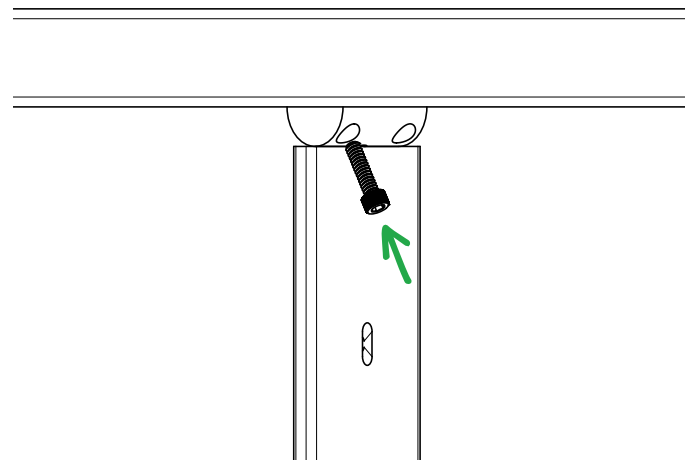
PRO TIPS:



- If needed, a 5/32" drill bit can be used with handrail mounting screws, just make sure to tap each hole using the 10-24 tap to avoid breaking your screws.
- Use machine oil, blow out each hole with canned air, and tap a second time for a cleaner tap.



1 Secure the handrail to the line post top using the Handrail Clamp for Line Posts. Tighten the nylon top screws first and then position and tighten one foot onto the post top and one onto the handrail.



3 Secure with one Signature Series Handrail Mounting Screws using a 5/32" driver.

4 Repeat **steps 2-3** on the other post top hole.

*d.i.y. your
dream view*