



## INSTALLATION INSTRUCTIONS



EVOLUTION™  
STEEL DECK FRAMING

## FREESTANDING FRAME & STAIR KIT INSTRUCTIONS

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INTRODUCTION

READ INSTRUCTIONS COMPLETELY BEFORE STARTING INSTALLATION

General Guidelines

It is the responsibility of the installer to meet all code and safety requirements, and to obtain all required building permits. The Deck Kit installer should determine and implement appropriate installation techniques for each installation situation. Fortress Building Products nor its distributors shall **NOT** be held liable for improper or unsafe installations.

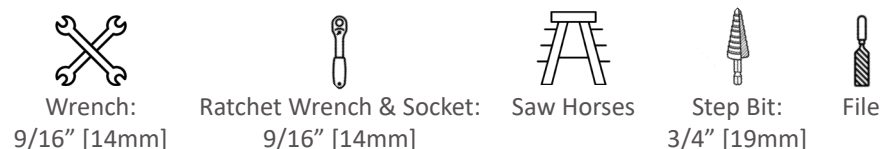
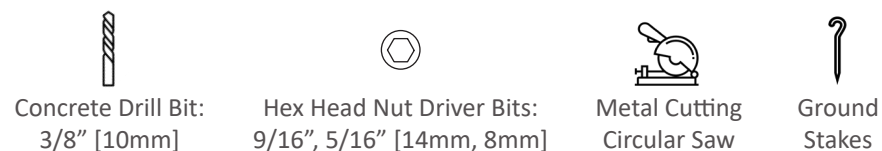
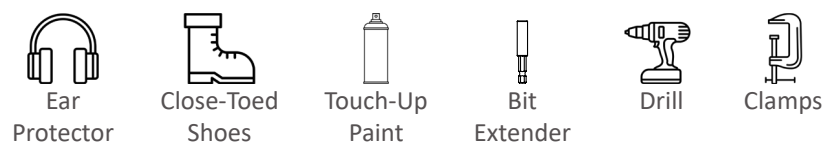
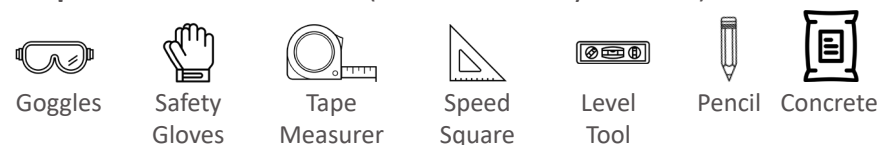
Personal Protection Equipment (PPE) must be worn anytime you’re using power tools and working with Evolution framing. Eye protection, hearing protection, closed-toe shoes, gloves, long sleeves, and pants must be worn to keep yourself safe.

As the Evolution steel framing parts are cut, all metal shavings and/or chips must be removed from inside the Evolution Framing parts. At the end of a work period, all steel shavings and/or chips must be cleaned off the jobsite. Not doing so could result in the staining of surrounding surfaces.

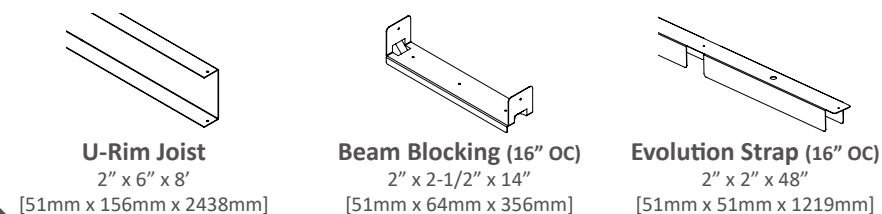
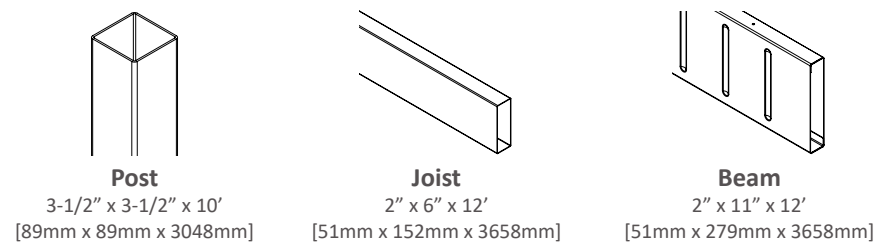
As the Evolution steel framing parts are cut, **DO NOT** allow metal shavings and/or chips to get dropped or blown into a pool, hot tub, or any other body of water. Failure to follow these instructions could result in staining of surfaces.

Fortress Building Products **DOES NOT** cover all possible installation scenarios within these instructions. In some cases, it may be necessary for you to consult a professional engineer, building code official, or local dealer. In addition, it may become necessary to use brackets other than Fortress’ when more complex installations take place.

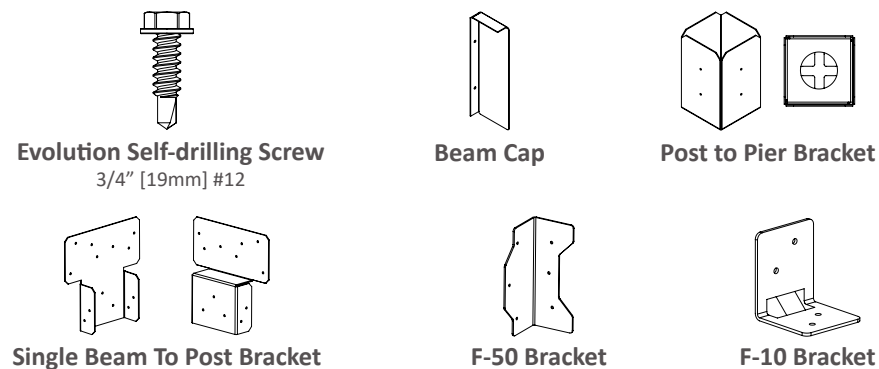
## Required Tools & Material (Not Provided By Fortress)



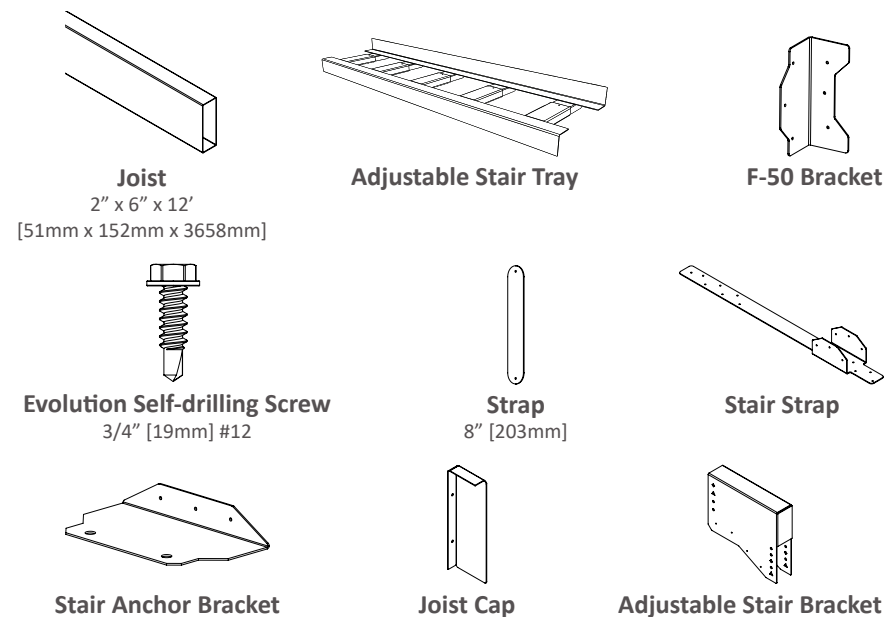
## Components: Free-standing Frame (Provided By Fortress)



DECK & STAIR KIT INSTALLATION: FREE-STANDING EVOLUTION FRAMING



## Components: Stair Kit (Provided By Fortress)



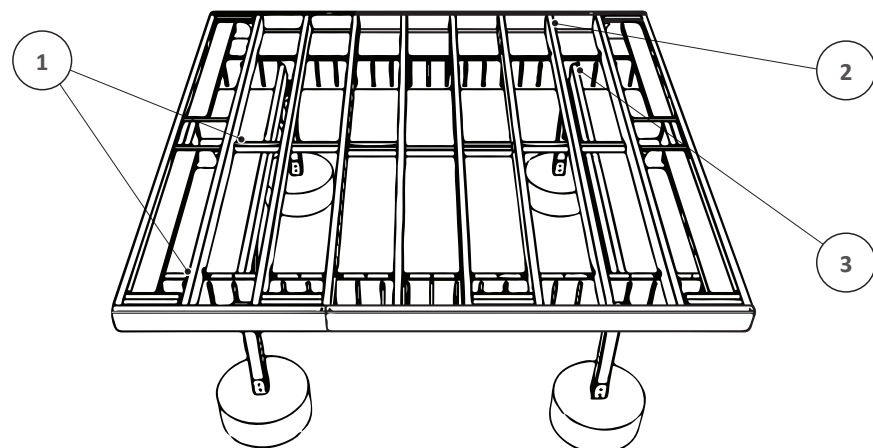
### Note:

- Components **ARE NOT** show to scale.

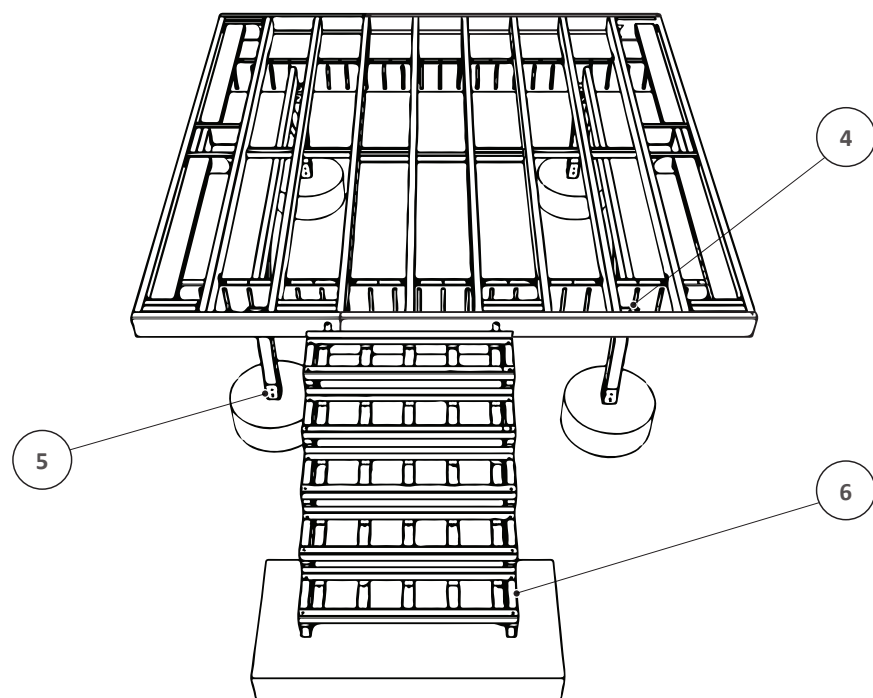
DECK & STAIR KIT INSTALLATION: FREE-STANDING EVOLUTION FRAMING

## INSTALLATION OVERVIEW

### Evolution Free-standing Framing Without Stair Kit



### Evolution Free-standing Framing With Stair Kit

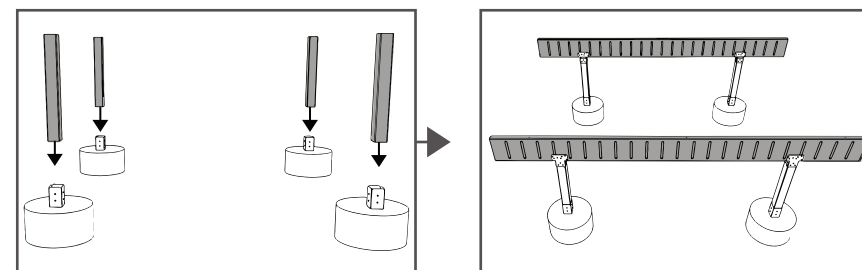


#### Connections:

- |                            |                    |                             |
|----------------------------|--------------------|-----------------------------|
| 1. Joists to Beam & Straps | 2. Joists to U-Rim | 3. Lateral Blocking to Beam |
| 4. Post To Beam            | 5. Post to Footing | 6. Stair Kit                |

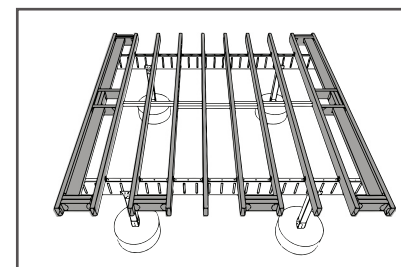
DECK & STAIR KIT INSTALLATION: FREE-STANDING EVOLUTION FRAMING

## Evolution Free-standing Framing Installation Process (Overview)



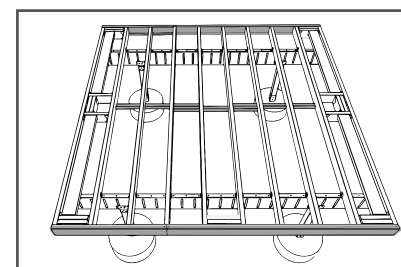
1.  
Mount Posts onto Footing

2.  
Install Single Beams & Beam Caps



3.  
Install Frame Joists & Post Blocking

4.  
Install Lateral Bracing



5.  
Install U-Rim Joists & Evolution Strap

6.  
Install Stair Kit (Optional)

#### Note:

Construction methodologies are always improving. Please visit [FortressBP.com](https://FortressBP.com) for the most up-to-date Installation Instructions.

DECK & STAIR KIT INSTALLATION: FREE-STANDING EVOLUTION FRAMING



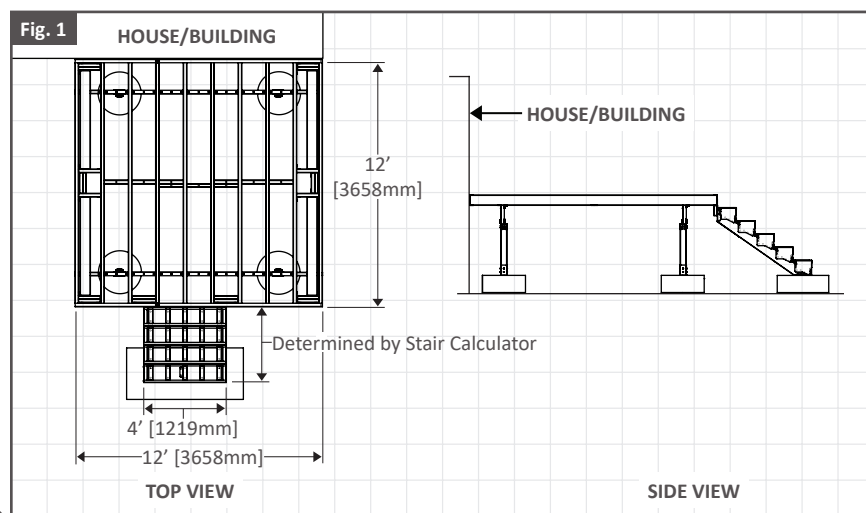
## PROJECT PLANNING

### Step 1: Sketch Layout of Framing Project

1. Sketch the top and side faces of the house/building profile.
2. Identify the desired location of your framing project.  
Reference Fig. 1 below for overall dimensions.
3. Sketch desired positioning of your free-standing frame.
4. If installing stairs, determine then sketch desired stair frame position. Reference Stair Kit installation instructions on pages 44 - 63 to determine stair landing positioning.
5. Sketch desired corner, front and side railing post locations. If installing stairs, stair posts should be positioned 4' [1219mm] apart.

#### Note:

- Stair Kit installation is optional.
- If installation **DOES NOT** include stairs, only one center railing post will be required on each side and front of deck.
- For installations using stairs, face of deck with stair (front or side) will require two posts.
- Determine desired installed infill Joist direction. Infill decking boards will be mounted perpendicular to Joists.
- When sketching layout, be sure to account for post to Beam overhang (24" [610mm] **maximum**) and Joist to Beam overhang (18" [457mm] **maximum**).

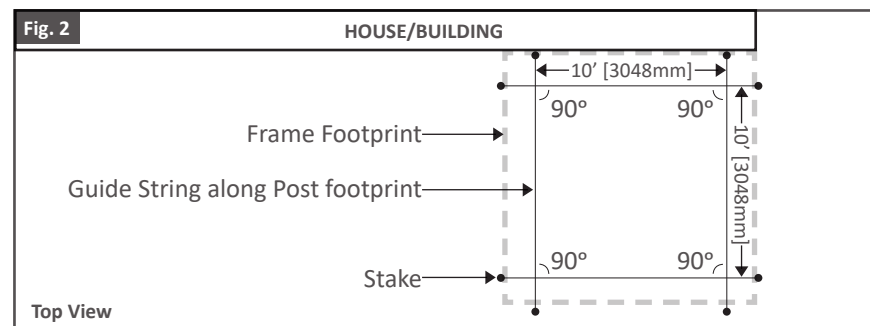


## Step 2: Create a Perimeter For The Post Footprint

1. Using Stakes and Guide String, create a perimeter around the post footprint. As shown in Fig. 2. **Recommended** Post footprint is 10' x 10' [3048mm x 3048mm].

### Tip:

- Be sure corners are set at 90° angles.
- Be sure post footprint is positioned to account for frame footprint and 1/2" [13mm] deck overhang.

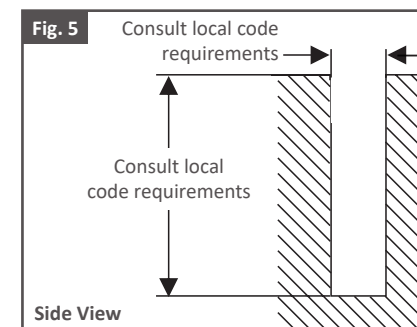
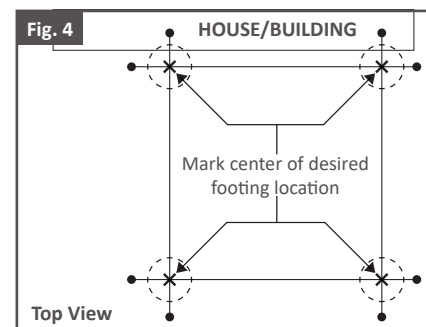
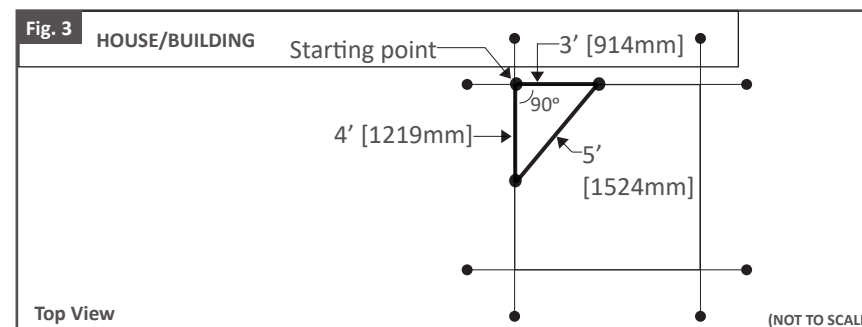


## Step 3: Mark & Dig Footing Hole Locations

1. **For a successful installation, confirm the created perimeter accurate and square.**
- **How To Square Perimeter:** Fortress recommends using the 3-4-5 rule. Measure and mark 3' [914mm] & 4' [1219mm] from the starting point along guide string, then measure between two markings. Adjust until measurement between markings is exactly 5' [1524mm]. As shown in Fig. 3. Larger triangles, with sides of 6-8-10 and 9-12-15, allow for even more accurate results.
2. Mark the center of Guide String cross points. This will be the center of the footings. As shown in Fig. 4.
3. Consult local code requirements for exact footing hole width and depth requirements. As shown in Fig. 5.
4. Dig the footing holes along previous center of footing markings using a Post Hole Digger.
5. Be sure to keep the Post Hole Digger straight and plumb when digging.
6. **DO NOT POUR CONCRETE IN THIS STEP.**

### Note:

- Call 811 before you dig the footing holes to locate and identify any buried utilities.
- When positioning footings, be sure to account for post to Beam overhang (24" [610mm] **maximum**) and Joist to Beam overhang (18" [457mm] **maximum**).

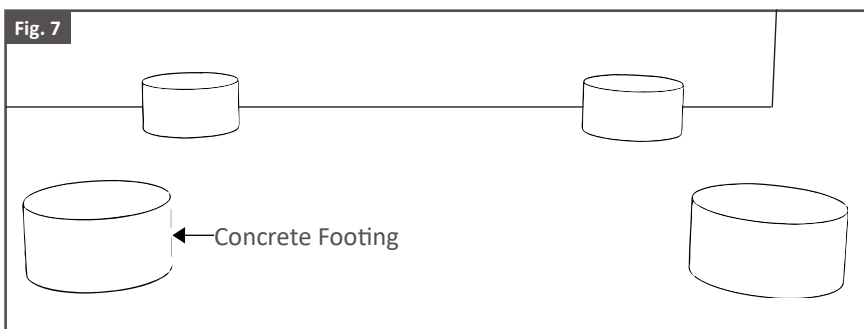
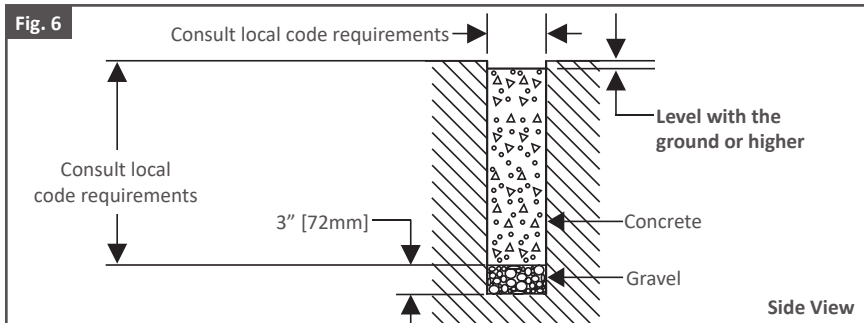


## Step 4: Pour Concrete into Footing Holes

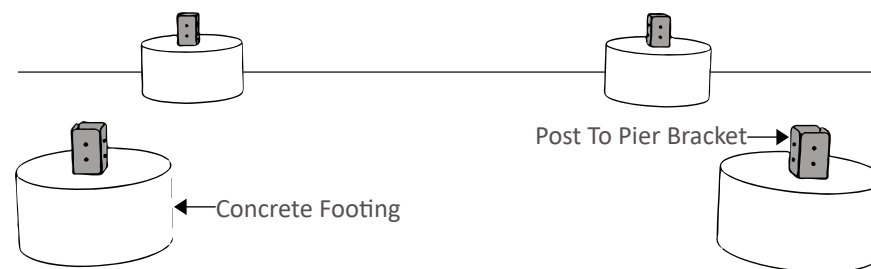
1. Fill footing holes with 3" [76mm] of gravel then concrete. The concrete should be level with or higher than the ground to keep water from pooling around the post base. As shown in Fig. 6 & 7.
2. **Be sure top surface of concrete is level.**

### Note:

- Follow manufacture instructions for required concrete cure time before installing Post To Pier Brackets.
- Footing requirements will vary in different geographical regions. Follow your local building codes for requirements.



## INSTALLATION: POST TO PIER BRACKETS

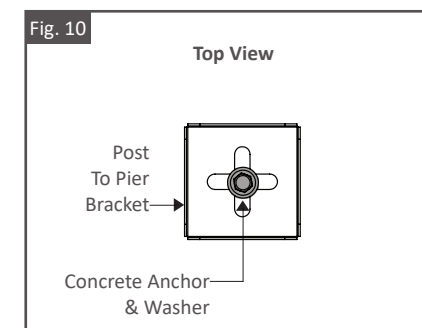
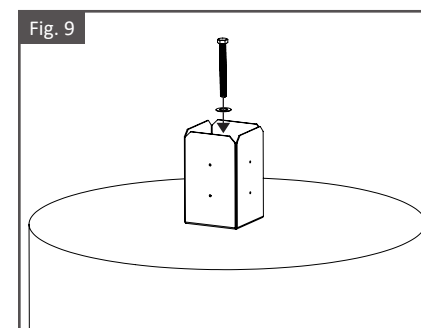
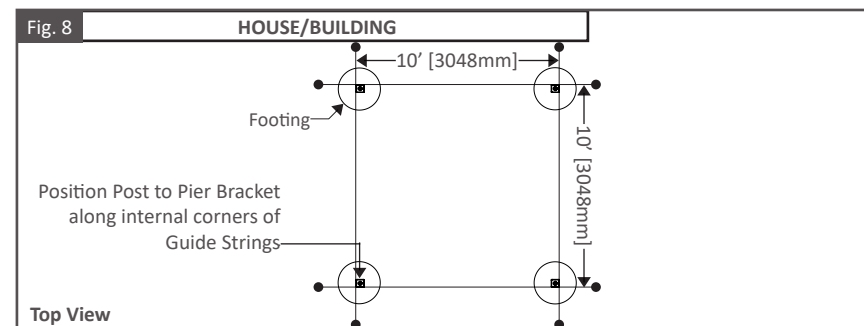


### Step 1: Mount Post to Pier Brackets onto Concrete Footings

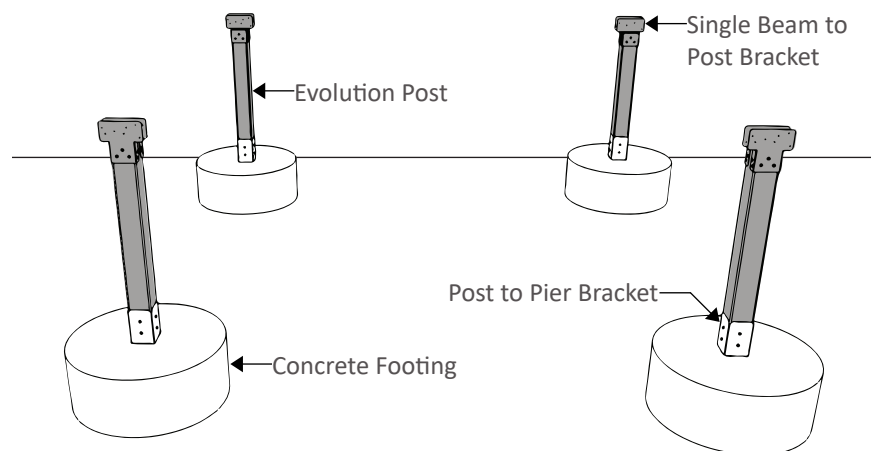
1. Reposition Stakes and Guide String (page 10, step 3).
2. Position Post to Pier Brackets along internal corners of Guide Strings. As shown in Fig. 8.
3. Pre-drill concrete footing, then mount Post to Pier Brackets onto surface using 3/8" x 3" [10mm x 76mm] Concrete Anchors. As shown in Fig. 9 & 10.

#### Note:

- It is critical for Post to Pier Brackets to maintain the positioning established in project planing instructions.



## INSTALLATION: POSTS



### Step 1: Mount Posts into Post to Pier Brackets

1. It is critical for post heights to be relatively even/coplanar once installed. This will help ensure the frame assembly is level once installed. Adjust posts as needed.
2. Cut posts to desired height. Reference cutting and painting instructions on pages 65 - 67. **Only one post is provided with each deck & stair kit. Be sure to confirm required post heights before cutting your provided post.**
3. Using Evolution Self-Drilling Screws, fasten Single Beam to Post Brackets onto top edge of post. As shown in Fig. 11 & 12.
4. Insert Posts into Post to Pier Brackets. As shown in Fig. 13.
5. Be sure to have Beam to Post Brackets orientated in desired direction to allow for the Beam to be mounted correctly. As shown in Fig. 14. Adjust if needed.
6. Confirm that the posts are level and plumb.
7. Fasten Posts onto Post to Pier Brackets using Evolution Self-Drilling Screws. As shown in Fig. 15. Continuously check if posts are level and plumb.

#### Note:

- It is critical for posts and post brackets to maintain the 90° angles established in project planing instructions steps 2 & 3, on page 10.

Fig. 11

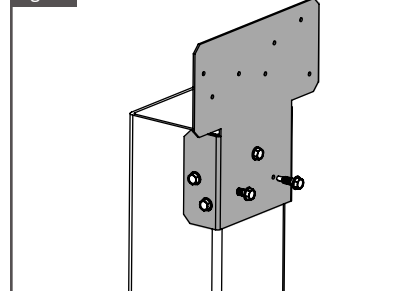


Fig. 12

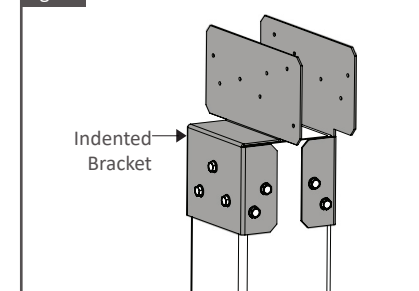


Fig. 13

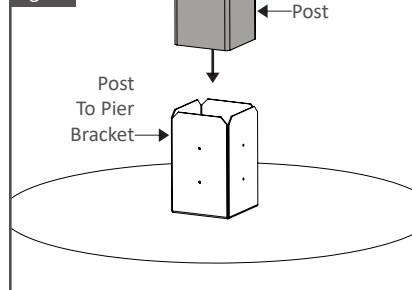


Fig. 14

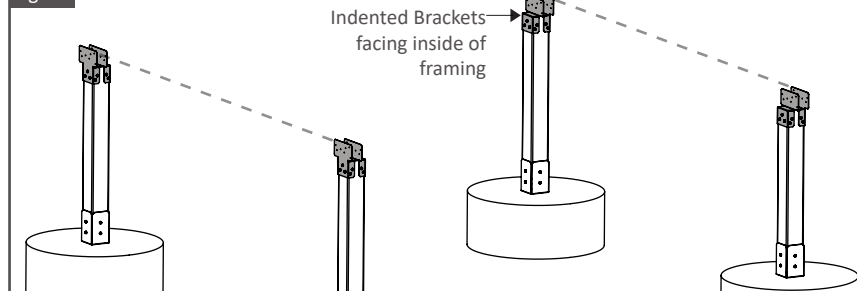
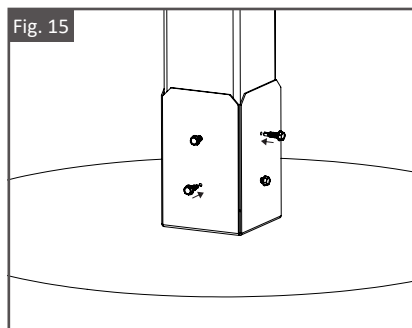
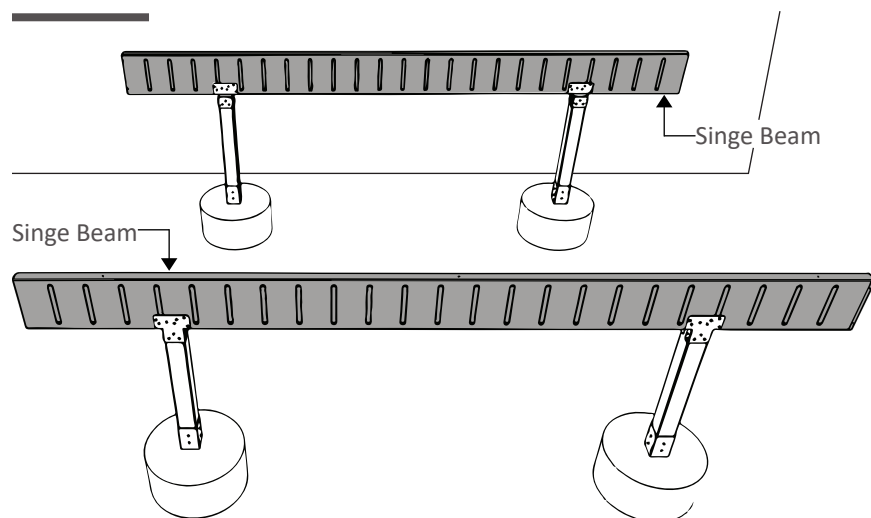


Fig. 15



## INSTALLATION: SINGLE BEAMS



### Step 1: Mount Single Beams onto Single Beam to Post Brackets

1. Position Beams into desired position in Single Beam to Post Brackets. As shown in Fig. 16.
2. All Beams contain holes to allow for water drainage. Be sure drainage holes on Beam face down once installed. As shown in Fig. 17. Adjust if needed.
3. Confirm ends of both the Beams are in Line. As shown in Fig. 18. Adjust if needed.
4. Determine Beam overhang. Be sure Beam overhang on each end does not exceed **maximum** overhang of 24" [610mm]. As shown in Fig. 19. Adjust as needed.
5. Measure opposite corners of Beams to confirm Beams are square. As shown in Fig. 20. Measurement 1 and measurement 2 should be equal. Adjust if needed. **FOR A SUCCESSFUL INSTALLATION IT IS CRITICAL FOR THE BEAMS TO BE SQUARE.**
6. While keeping the Beams in position, use Evolution Self-Drilling Screws to fasten Single Beam to Post Brackets onto each Beam. As shown in Fig. 21. The use of Clamps is recommended to keep Beams in desired position.
7. Be sure each Beam remains plumb as you fasten brackets onto Beams. As shown in Fig. 22.

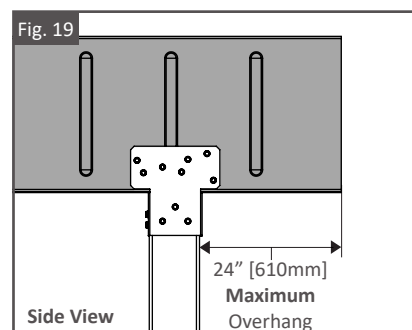
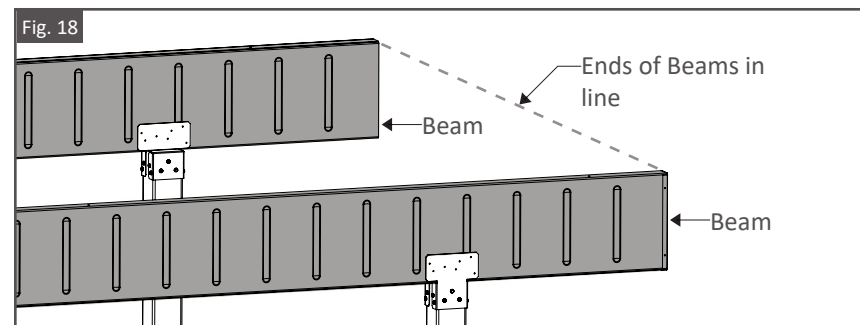
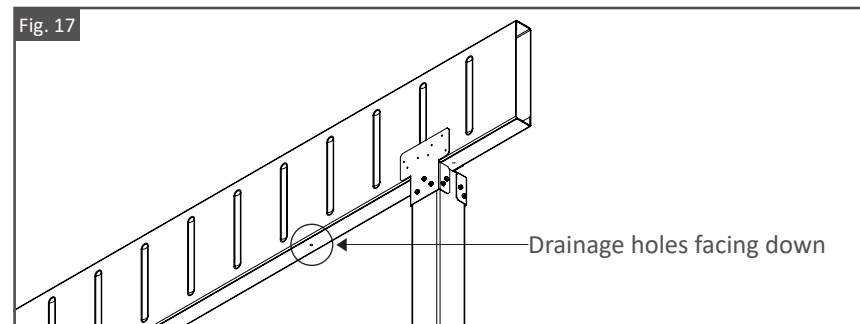
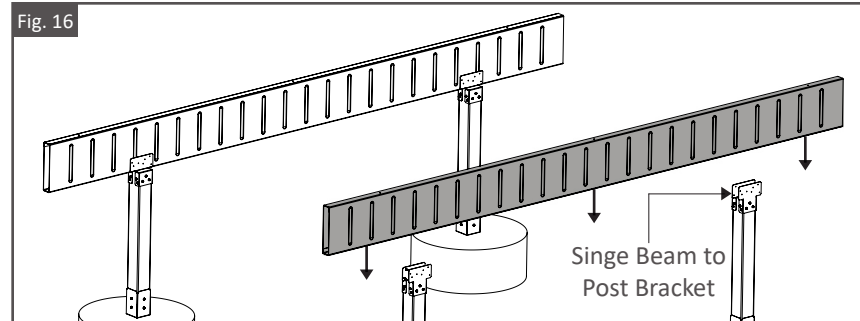


Fig. 20

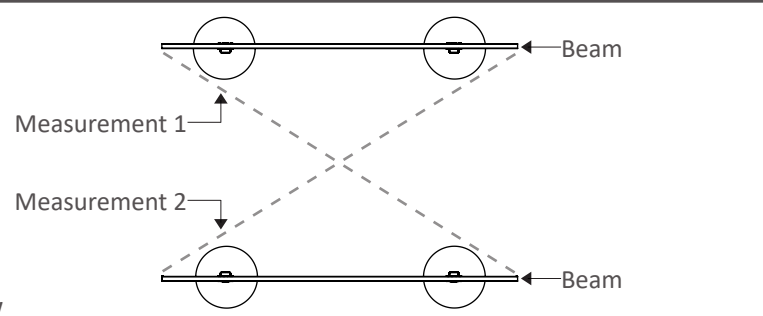


Fig. 21

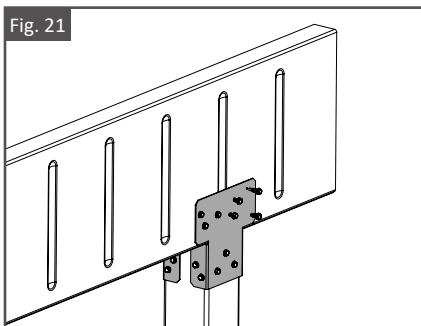
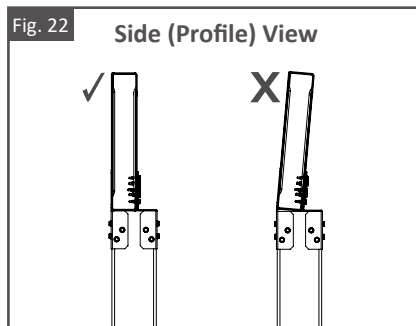


Fig. 22

Side (Profile) View



### Step 2: Install Beam Cap

1. Position the Beam Caps onto the ends of Beams. As shown in Fig. 23.
2. Using Evolution Self-drilling Screws, fasten Beam Caps onto Beams. As shown in Fig. 24.

Fig. 23

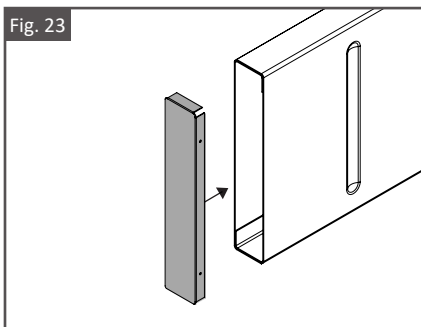
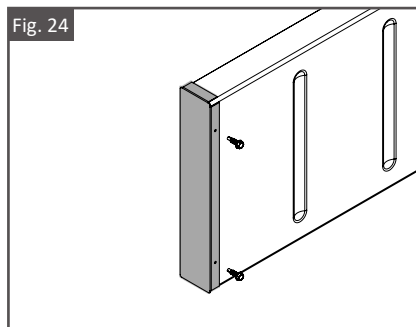
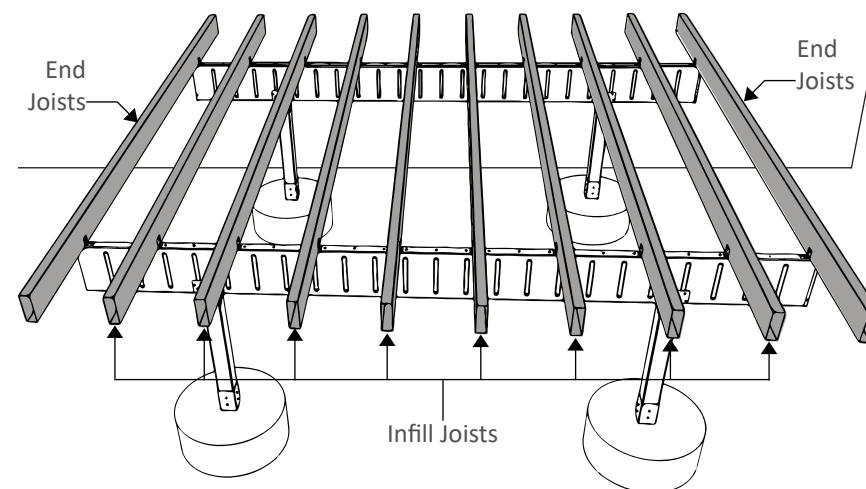


Fig. 24



## INSTALLATION: FRAME JOISTS

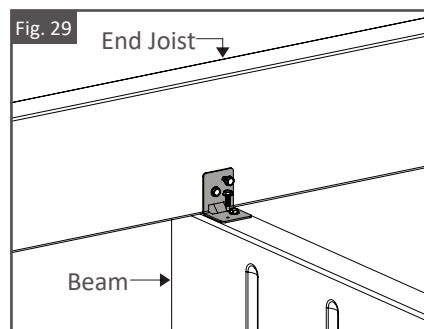
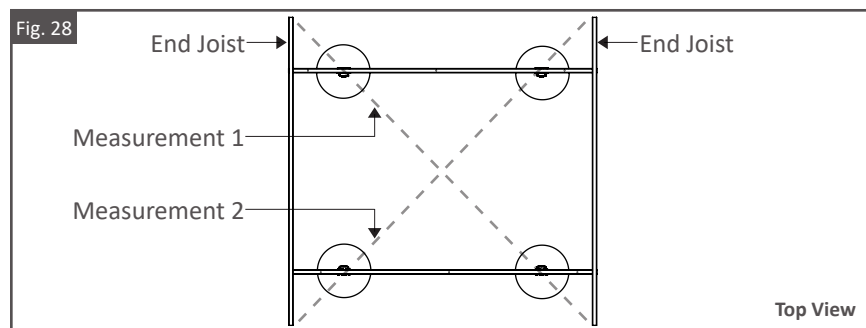
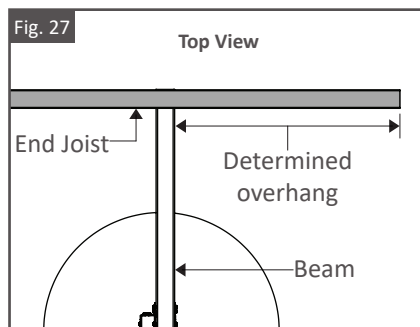
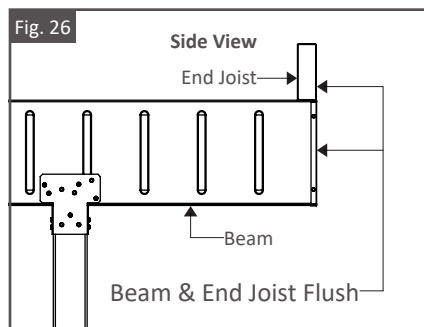
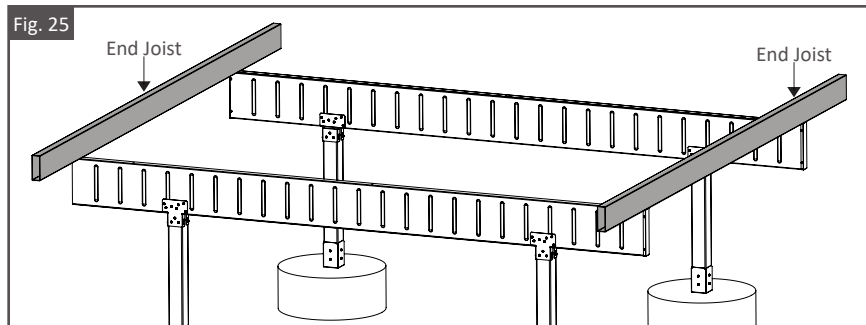


### Step 1: Mount End Joists

1. Position End Joists flush with ends of Beams. As shown in Fig. 25 & 26.
2. All Joists contain holes to allow for water drainage. Be sure drainage holes on joist face down once installed. As shown in Fig. 17 on page 17. Adjust if needed.
3. Beam to End Joist overhang should be equal on both ends of joists. As shown in Fig. 27.
4. Measure opposite corners of End Joists to confirm Joists are square. As shown in Fig. 28. Measurement 1 and measurement 2 should be equal. Adjust if needed. **FOR A SUCCESSFUL INSTALLATION IT IS CRITICAL FOR THE END JOISTS TO BE SQUARE.**
5. Using F-10 Brackets and Evolution Self-drilling Screws, fasten End Joists onto both Beams at each contact point. As shown in Fig. 29.

### Tip:

- Be sure End Joists are square and flush with end faces of Beams when fastening.



## Step 2: Mount Infill Joists

1. Starting from one end, measure and mark 13-1/16" [332mm] from the inside face of an End Joist onto the top face of each Beam. **Measurement is critical for a successful installation.**
2. Position the back face of an F-10 Bracket onto each Beam marking facing towards the inside face of the End joist. As shown in Fig. 30.
3. Using Evolution self-drilling screws, fasten the F-10 Brackets onto each Beam. As shown in Fig. 31.
4. Position the first Infill Joist flush against outside face of the mounted F-10 Brackets and the top face of each Beam.
5. Confirm the Infill Joist overhang is in line with the End Joist. As shown in Fig. 32. Adjust as needed.
6. Using Evolution Self-drilling Screws, fasten the Infill Joist onto the F-10 Brackets. As shown in Fig. 32. Be sure the Infill Joist is plumb when fastening.
7. Position Evolution Beam Blocking flush with the side face of the Infill Joist and on top of each Beam.
8. Using Evolution Self-drilling Screws, fasten Beam Blocking onto the Infill Joist and Beam. As shown in Fig. 33. Be sure the Beam Blocking is flush with the Infill Joist when fastening.
9. Repeat steps 2 : 4 - 8 for the remaining 7 Infill Joists. Be sure to flip the Beam Bracket lip from inside to outside facing with each Joist mount. As shown in Fig. 34 & 35.
10. On the final Infill Joist, fasten an F-10 Bracket onto each Beam. As shown in Fig. 36.

### Tip:

- Be sure ends of Joists are plumb & in line when fastening.
- Be sure Beam Blocking is flush with Infill Joists when fastening.
- Guide String stretched between End Joists can be used to keep overhang of End and Infill Joists in line.

Fig. 30

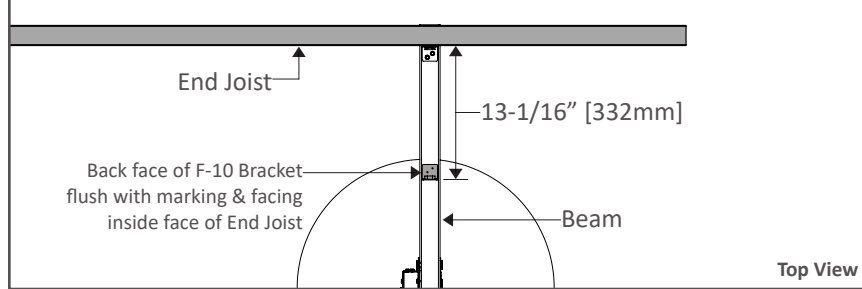


Fig. 31

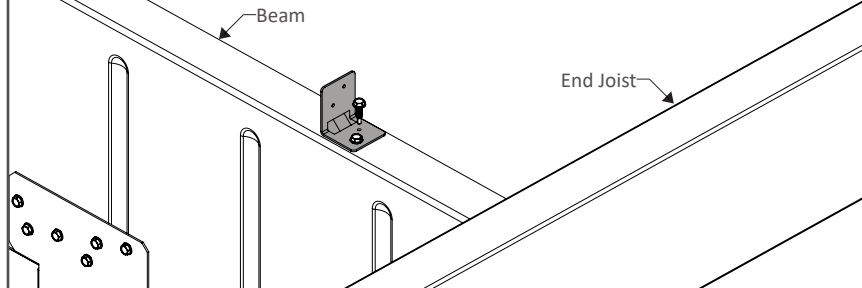


Fig. 32

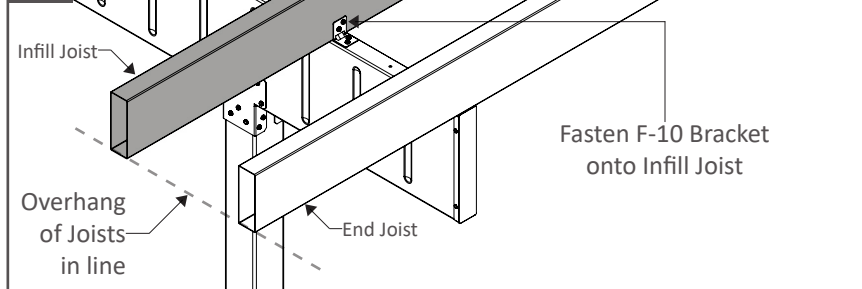


Fig. 33

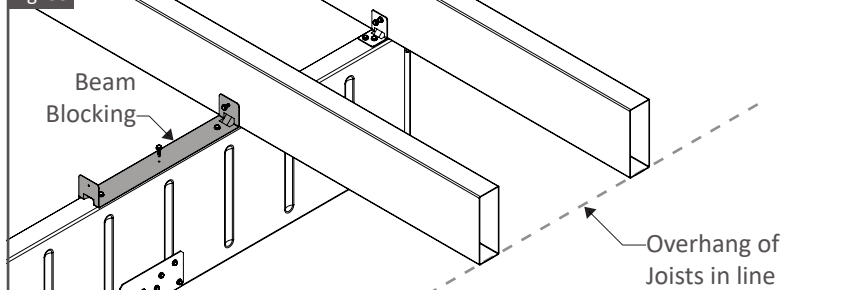


Fig. 34

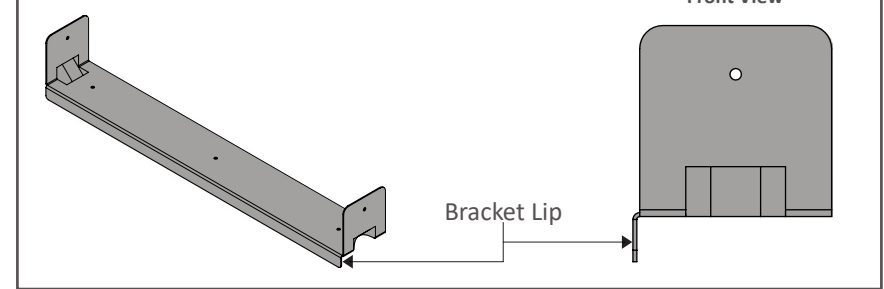


Fig. 35

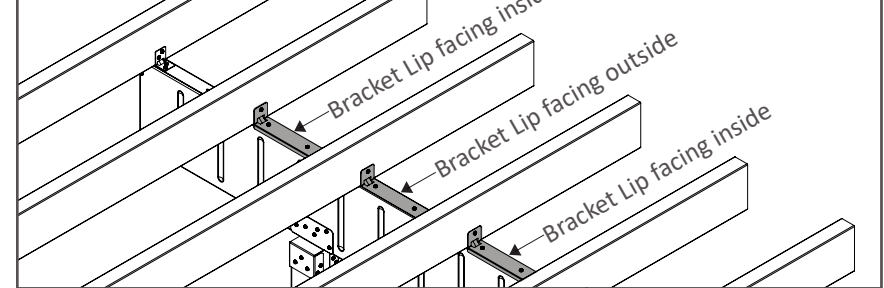
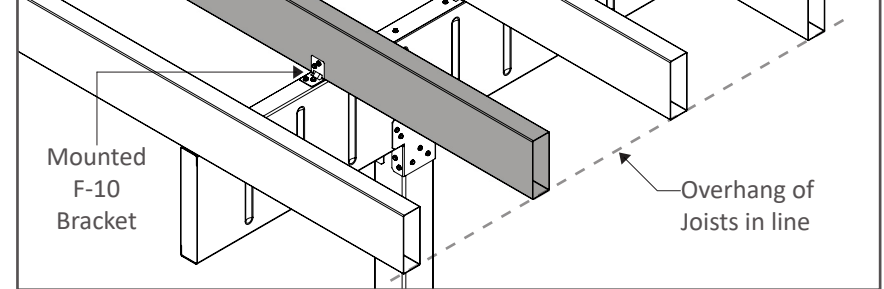
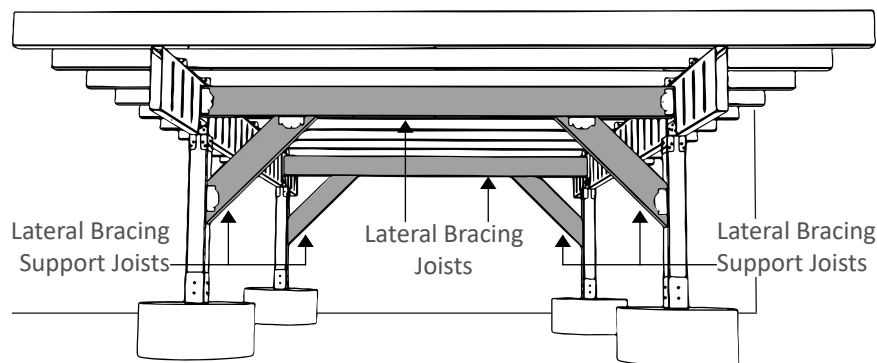


Fig. 36





## INSTALLATION: LATERAL BRACING JOISTS



### Step 1: Cut Joists to length

1. Measure opening between inside faces of Beams. As shown in Fig. 37.
2. Cut two Lateral Bracing Joists to measured length. As shown in Fig. 38.
3. Cut four 30" [762mm] Lateral Bracing Support Joists with 45° miter cuts. As shown in Fig. 38.

#### Note:

- Reference cutting & painting instructions on pages 65 - 67.

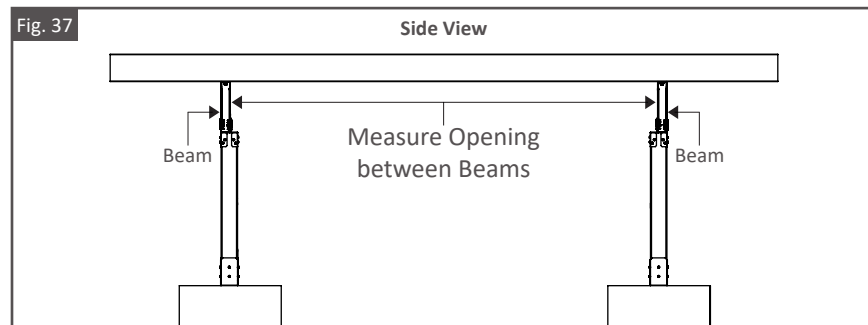
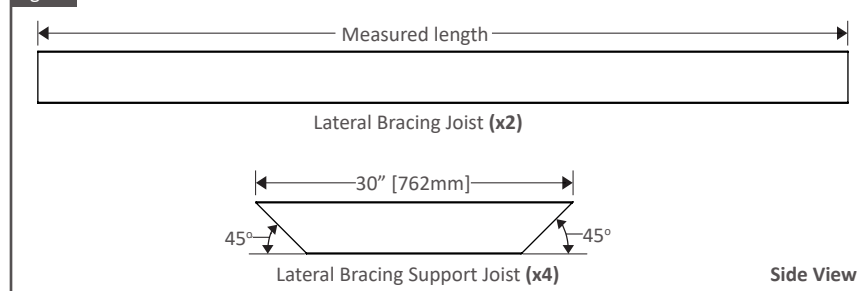


Fig. 38



### Step 2: Mount Lateral Bracing Joists

1. Position F-50 Brackets onto Beams with outside face of brackets and post in line. As shown in Fig. 39.
2. Using Evolution Self-drilling Screws, fasten the F-50 Brackets onto Beams. As shown in Fig. 40.
3. Position cut Joists between opposite F-50 Brackets.
4. Using Evolution Self-drilling Screws, fasten the Lateral Bracing Joists onto the F-50 Brackets. As shown in Fig. 41.

Fig. 39

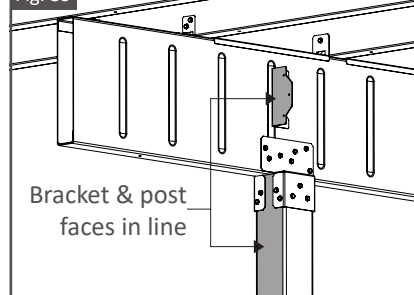


Fig. 40

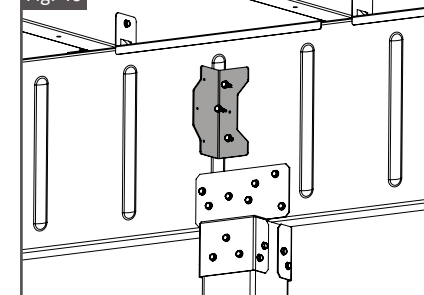
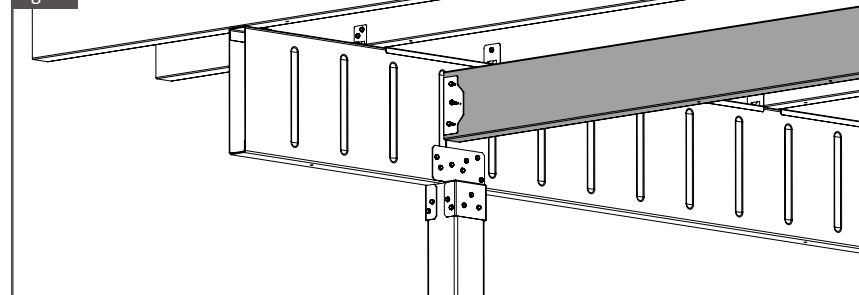
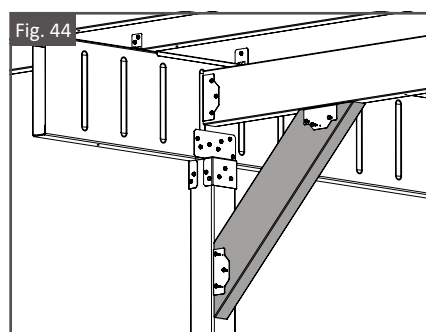
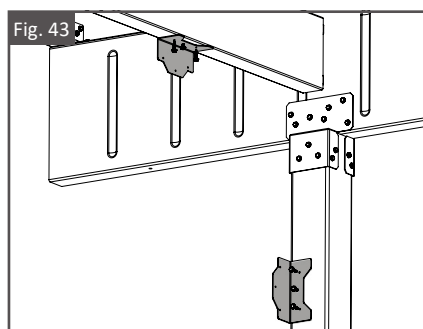
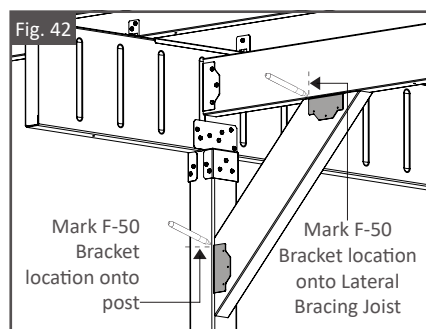


Fig. 41

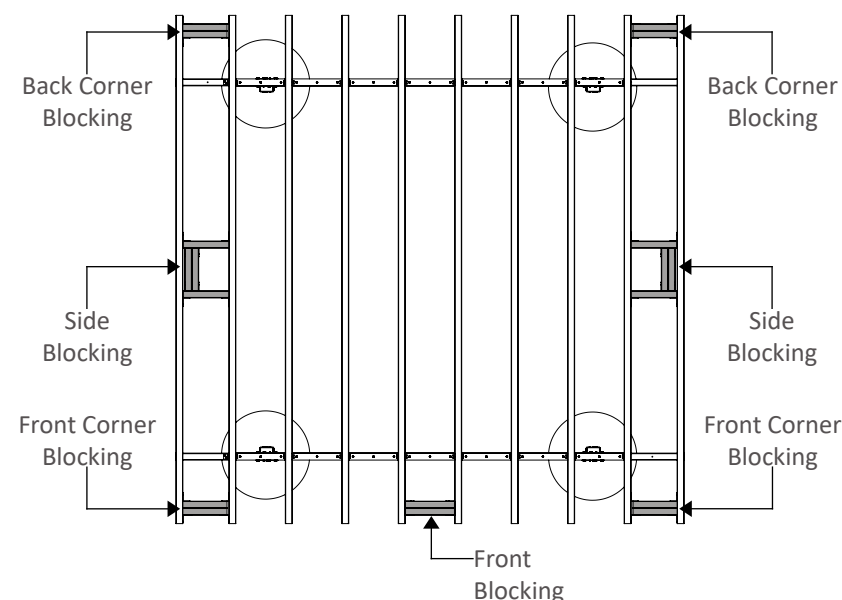


### Step 3: Mount Lateral Bracing Support Joists

1. Position F-50 Brackets and cut Lateral Bracing Support Joists between post and mounted Lateral Bracing Joists.
2. Push brackets and Joists as high and tight as possible.
3. Mark F-50 Bracket locations onto mounted Lateral Bracing Joists and Posts. As shown in Fig. 42.
4. Remove Lateral Bracing Support Joists.
5. Position F-50 Brackets between previous markings, be sure outer faces of brackets are flush with Lateral Bracing Joist and post faces.
6. Using Evolution Self-drilling Screws, fasten the F-50 Brackets onto the Lateral Bracing Joist and Post. As shown in Fig. 43.
7. Position Lateral Bracing Support Joists between mounted F-50 Brackets.
8. Using Evolution Self-drilling Screws, fasten the Lateral Bracing Joists onto the F-50 Brackets. As shown in Fig. 44.



### INSTALLATION: POST BLOCKING



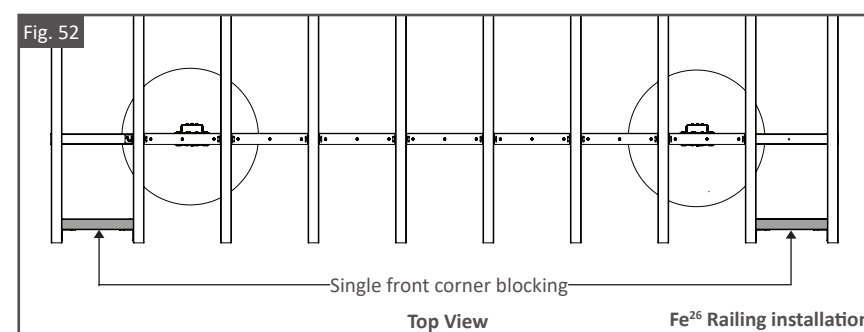
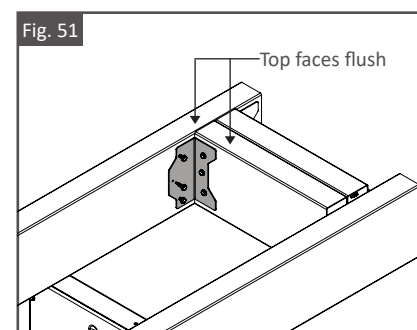
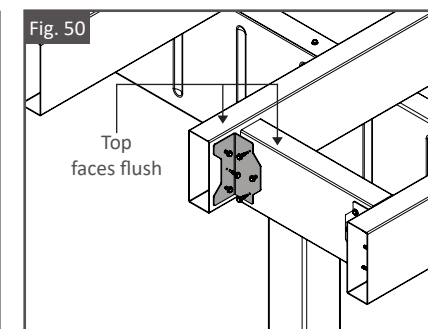
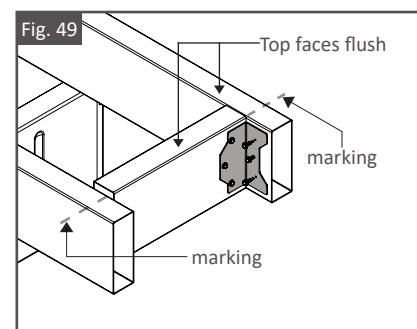
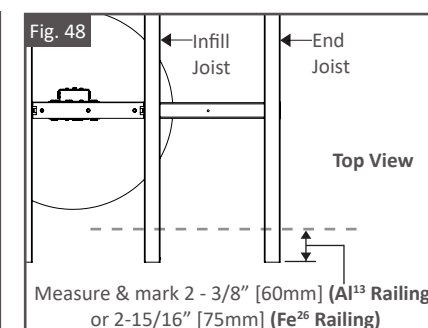
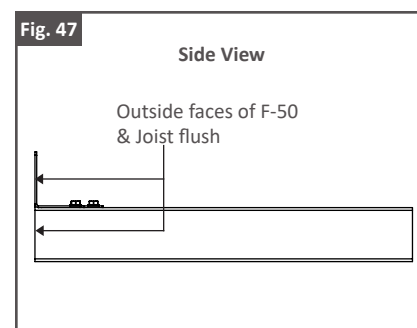
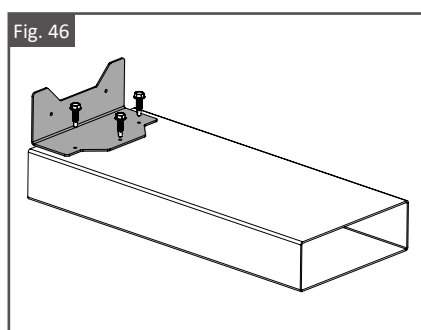
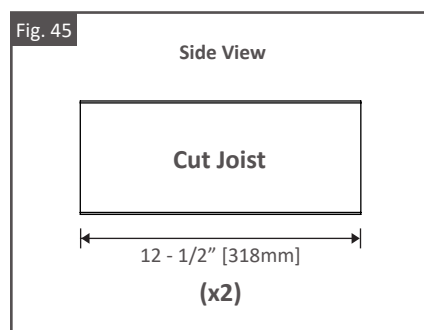
### Step 1: Mount Corner Post Blocking

1. Cut two Joists to 12-1/2" [318mm] lengths. As shown in Fig. 45.
2. Using Evolution Self-drilling Screws, fasten one F-50 Bracket onto each cut Joist. As shown in Fig. 46 & 47.
3. **For Al<sup>13</sup> Railing installation**, measure and mark 2-3/8" [60mm] from ends of the End joist and first Infill Joist. As shown in Fig. 48.
4. **For Fe<sup>26</sup> Railing installation**, measure and mark 2-15/16" [75mm] from ends of the End Joist and first Infill Joist. As shown in Fig. 48.
5. Position face of first cut Joist with F-50 Bracket flush with markings. Be sure the F-50 Bracket is facing out away from the frame.
6. Using Evolution Self-drilling Screws, fasten the F-50 Bracket onto the End Joist. As shown in Fig. 49. Be sure the top faces of all joists are flush and the bracket is plumb/perpendicular to joists.
7. Position the second F-50 Bracket on opposite end of the cut Joist and flush with face of the Infill joist.

8. Using Evolution Self-drilling Screws, fasten the second F-50 Bracket onto the Infill & cut Joists. As shown in Fig. 50. Be sure the top faces of all joists are flush and the bracket is plumb/perpendicular to joists.
9. **For Al<sup>13</sup> Railing installation**, position the second cut Joist flush with the inside face of the mounted first cut Joist. Be sure the F-50 Bracket is facing away from the first cut Joist.
  - **For Fe<sup>26</sup> Railing installation**, only one cut Joist is required for each of the two front corner blocking. As shown in Fig. 52.
10. Using Evolution Self-drilling Screws, fasten the F-50 Bracket onto the End Joist. As shown in Fig. 51. Be sure the top faces of all Joists are flush and the bracket is plumb/perpendicular to Joists.
11. Repeat step 1: 6 - 8 for mounting second cut Joist F-50 Brackets.
12. Repeat step 1: 1 - 11 to mount required post blocking for remaining three corners.

**Note:**

- **For successful railing post mounting, be sure F-50 Brackets are mounted in displayed orientation.**
- Reference cutting & painting instructions on pages 65 - 67.



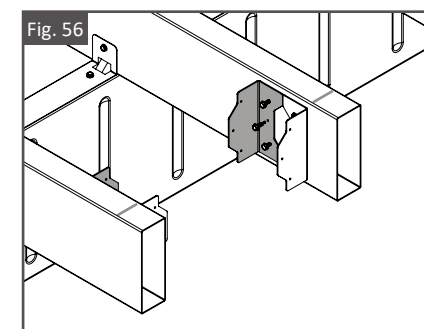
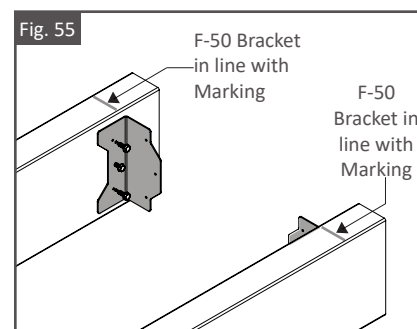
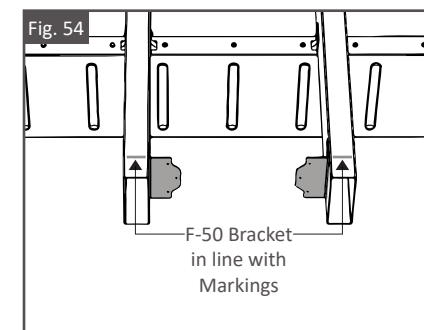
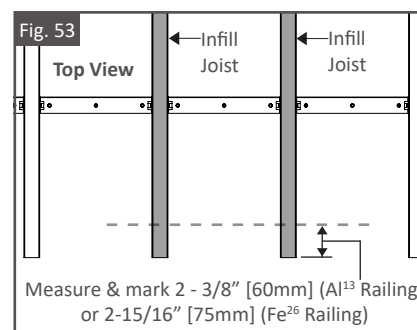
## Step 2: Mount Front Post Blocking

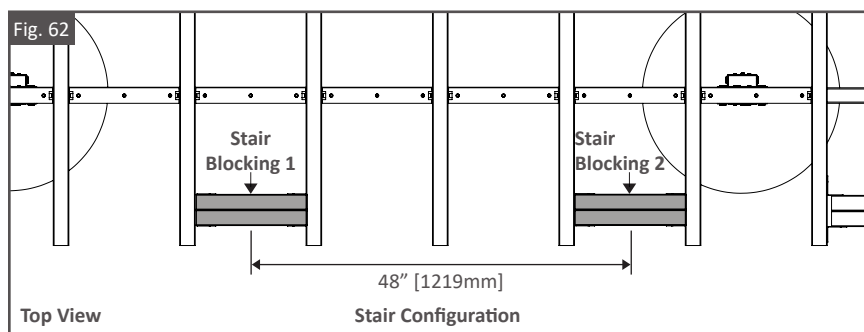
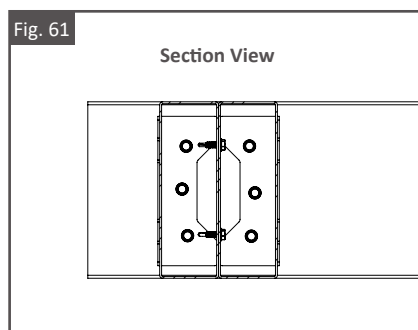
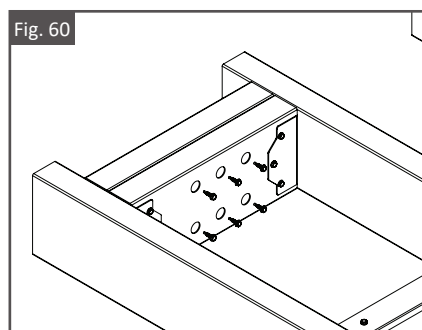
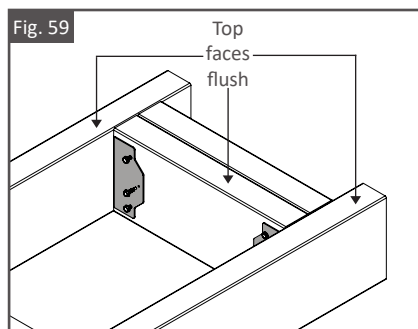
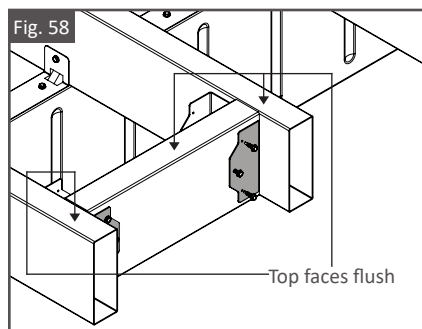
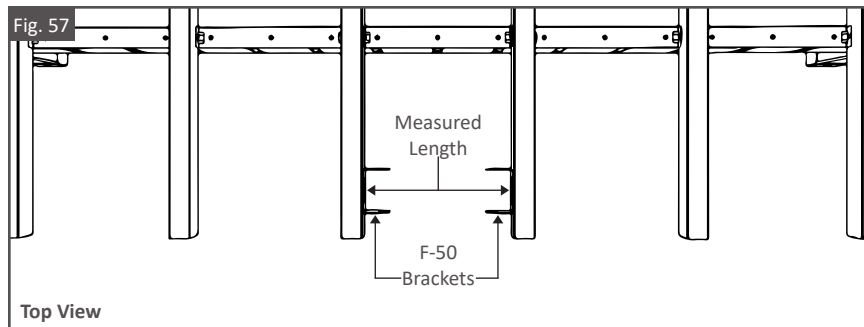
1. Reference step 1 of project planning instructions (pages 8 & 9) for determined front face Post location(s).
2. Determine Joists front face blocking will be positioned in between.
3. **For Al<sup>13</sup> Railing installation:** measure and mark 2-3/8" [60mm] from ends of the End joist and first Infill Joist. As shown in Fig. 53.
4. **For Fe<sup>26</sup> Railing installation:** measure and mark 2-15/16" [75mm] from ends of the End joist and first Infill Joist. As shown in Fig. 53.
5. Position F-50 Brackets in line with markings on each Joist. As shown in Fig. 54. Be sure the F-50 Brackets centered on the joists and are facing in towards the frame.
6. Using Evolution Self-drilling Screws, fasten an F-50 Bracket onto each Joist. As shown in Fig. 55. Be sure the brackets are plumb/perpendicular to joists when fastening.
7. Position second F-50 Brackets in front of the mounted brackets with the side and top faces flush.
8. Using Evolution Self-drilling Screws, fasten the second F-50 Brackets onto each Joist. As shown in Fig. 56. Be sure the brackets are plumb/perpendicular to joists when fastening.
9. Measure opening between faces of opposite F-50 Brackets. As shown in Fig. 57.
10. Cut two Joists to measured lengths.
11. Position first cut Joist flush with inside face of opposite F-50 Brackets and top face of Joists.
12. Using Evolution Self-drilling Screws, fasten the F-50 Brackets onto the cut Joist. As shown in Fig. 58. Be sure the top faces of all joists are flush.
13. Repeat steps 2: 11 & 12 for mounting second cut Joist. Reference Fig. 59 for mounted second cut Joist.
14. Using a Step Bit, drill six 3/4" [19mm] holes on the inside face of the first cut Joist.

15. Using Evolution self-drilling screws, fasten the two cut Joists together through the drill holes. As shown in Fig. 60 & 61. Use a bit extender when fastening the two cut Joists together. Be sure screws are positioned to avoid through bolts of railing posts.

### Note:

- **IF** installing stair frame, two post blocking assemblies 48" [1219mm] apart on center will be required. As shown in Fig. 62.
- **IF NOT** installing stair frame, only one post blocking assembly will be required for the front face of framing. This blocking should be placed where you anticipate railing post to be mounted.
- **For successful railing post mounting, be sure F-50 Brackets are mounted in displayed orientation.** This will allow railing post base through bolts to be mounted without interference from F-50 Bracket screws.
- Reference cutting & painting instructions on pages 65 - 67.



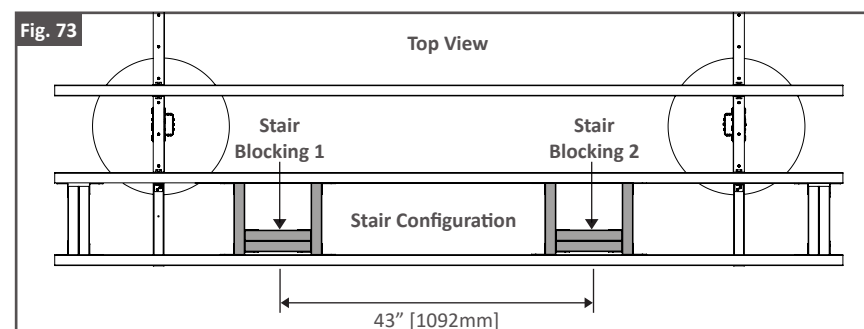
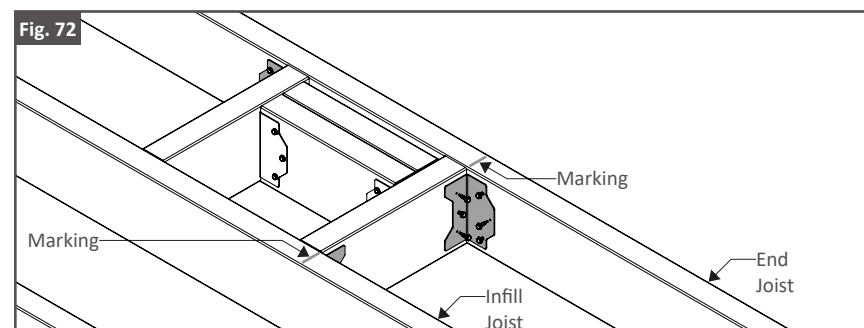
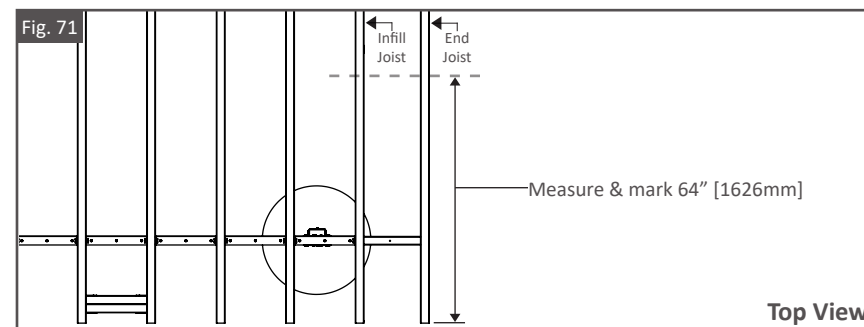
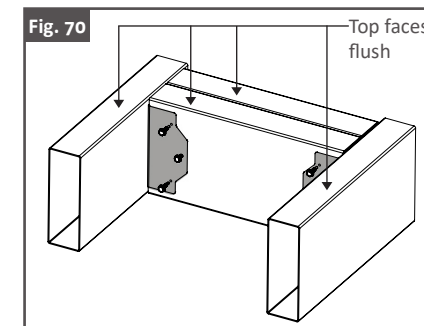
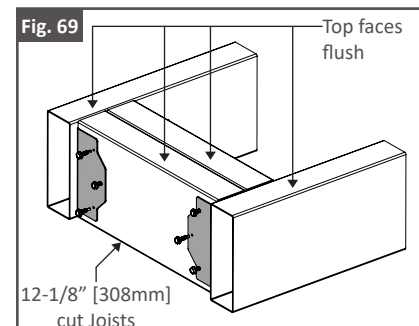
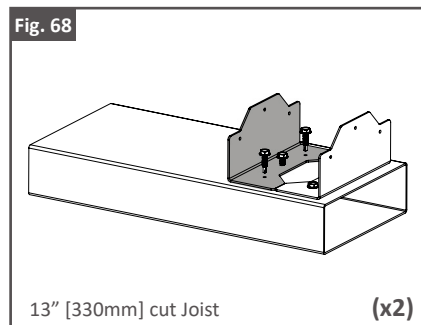
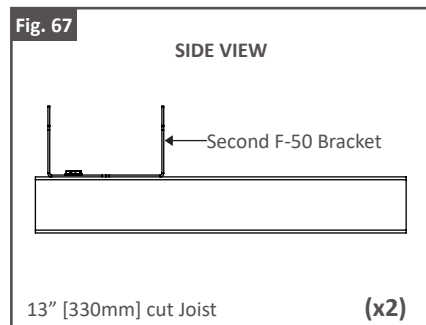
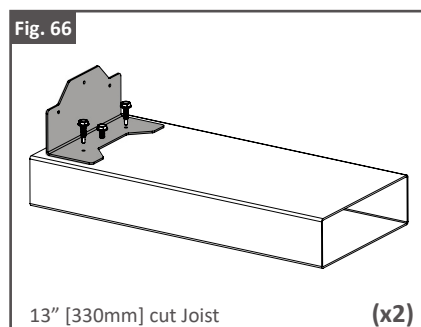
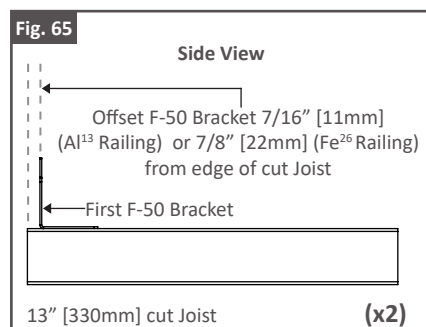
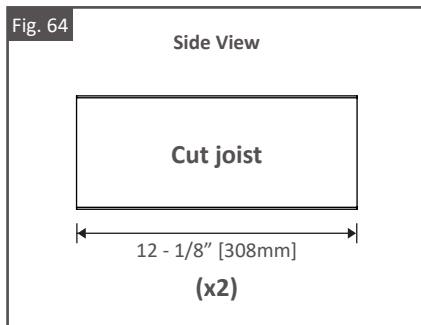
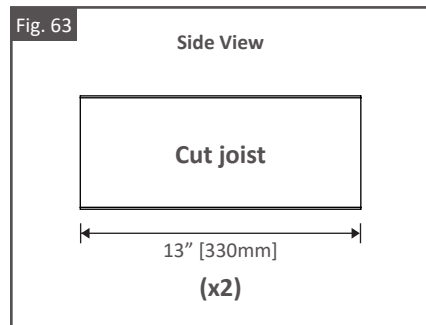


### Step 3: Mount Side Post Blocking

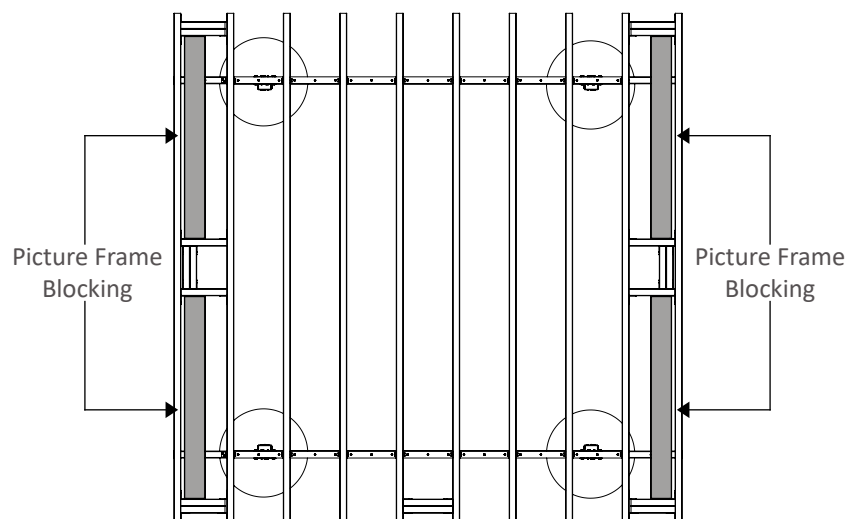
1. Cut two Joists to 13" [330mm] lengths. As shown in Fig. 63.
2. Cut two Joists to 12-1/8" [308mm] lengths. As shown in Fig. 64.
3. **For Al<sup>13</sup> Railing installation**, Position and offset an F-50 Bracket 7/16" [11mm] from the end of each 13" [330mm] cut Joist. As shown in Fig. 65.
4. **For Fe<sup>26</sup> Railing installation**, Position and offset an F-50 Bracket 7/8" [22mm] from the end of each 13" [330mm] cut Joist. As shown in Fig. 65.
5. Using Evolution Self-drilling Screws, mount the F-50 Brackets onto each 13" [330mm] cut Joists. As shown in Fig. 66.
6. Position second F-50 Brackets in front of the mounted brackets with the side and top faces flush. As shown in Fig. 67.
7. Using Evolution Self-drilling Screws, fasten the second F-50 Brackets onto each 13" [330mm] cut Joists. As shown in Fig. 68.
8. Position 12-1/8" [308mm] cut Joists between mounted F-50 Brackets.
9. Using Evolution Self-drilling Screws, fasten the F-50 Brackets onto the 12-1/8" [308mm] cut Joist. As shown in Fig. 69 & 70. **Be sure the top faces of all joists are flush.**
10. Measure and mark 64" [1626mm] from front ends of the End joist and first Infill Joist of the framing. As shown in Fig. 71.
11. Position the cut Joist assembly between the End Joist and Infill Joist with side face of assembly facing front end of frame flush with markings.
12. Be sure 12-1/8" [308mm] cut Joists of assembly are facing the End Joist. Adjust if needed.
13. Position F-50 brackets along outside corners of assembly and fasten onto End Joist and Infill Joist. As shown in Fig. 72. **Be sure the top faces of all joists are flush.**

**Note:**

- **IF** installing stair frame, two post blocking assemblies 43" [1092mm] apart on center will be required. As shown in Fig. 73.
- **Be sure to take into account stair railing post locations when positioning side blocking.**
- Reference cutting & painting instructions on pages 65 - 67.



## INSTALLATION: PICTURE FRAME BLOCKING



### Step 1: Mount Picture Frame Blocking

1. Measure each opening between corner post blocking and side post blocking. As shown in Fig. 74.
2. Cut four Joists to measured lengths minus 1/2" [13mm] to account for screw heads. As shown in Fig. 75.
3. Using Evolution Self-drilling Screws, Mount two F-50 Brackets onto opposite ends of each cut Joist. Be sure the outside edge of the F-50 Brackets overhang 1/4" [6mm] from the edge of the joist. As shown in Fig. 76 & 77.
4. Measure and mark 3" [76mm] from outside face of the End joist to the corner post blocking and side post blocking. As shown in Fig. 78.
5. Position cut Joist assembly along markings and flush with top faces of framing Joists. As shown in Fig. 79 & 80.
6. Using Evolution Self-drilling Screws, fasten the F-50 Brackets of the cut Joist assembly onto the corner post blocking and side post blocking. As show in Fig. 82.

#### Note:

- Be sure to measure each opening as lengths may vary.
- If installing stair frame, three picture frame blocking assemblies will be required. As shown in Fig. 82.
- Reference cutting & painting instructions on pages 65 - 67.

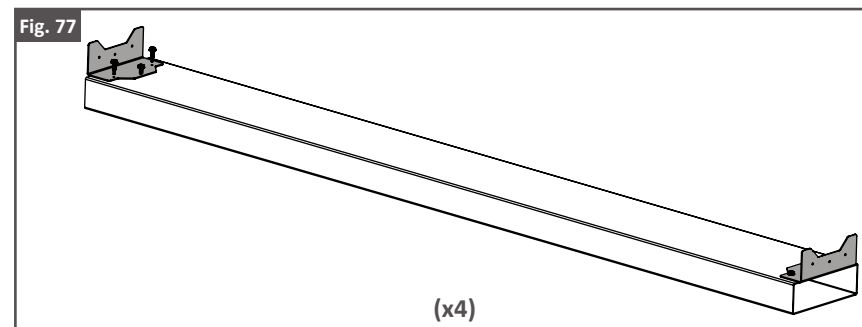
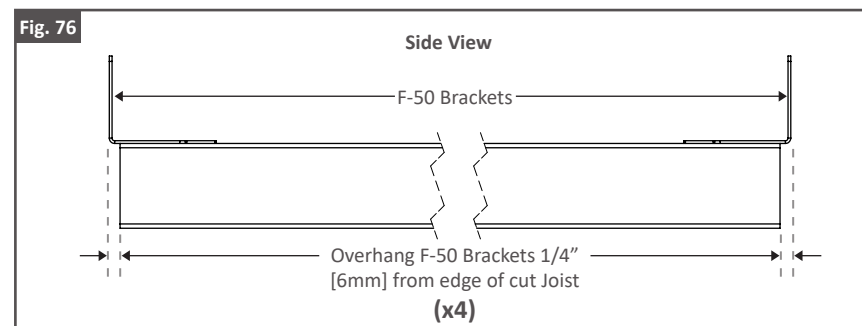
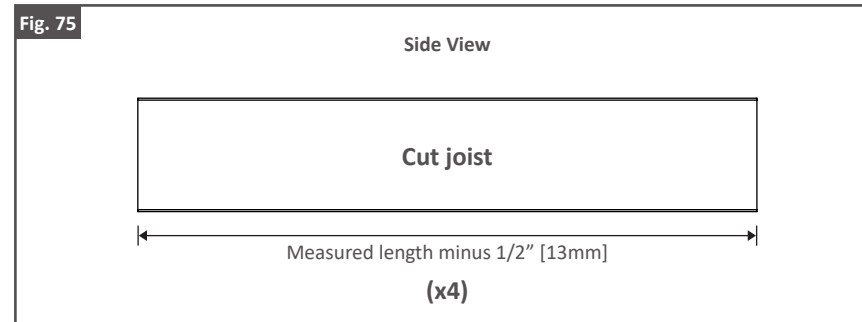
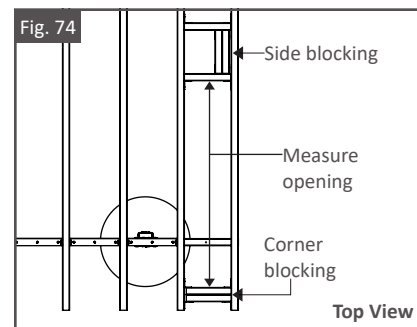


Fig. 78

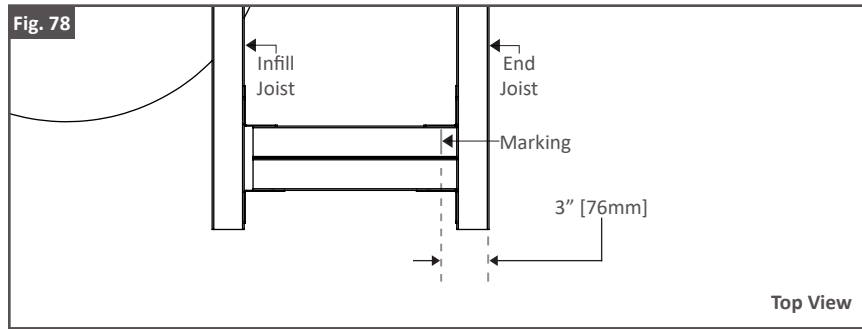


Fig. 79

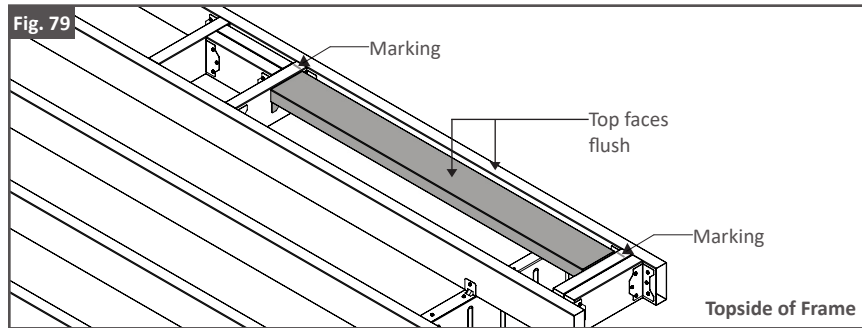


Fig. 80

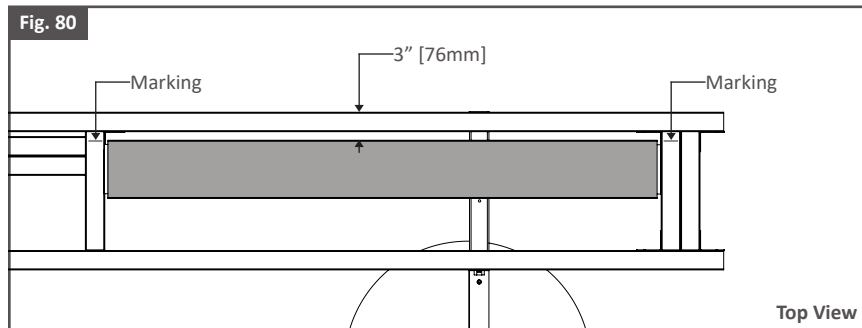


Fig. 81

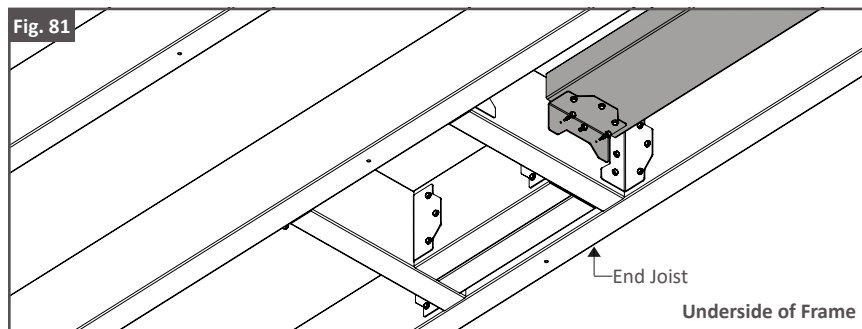
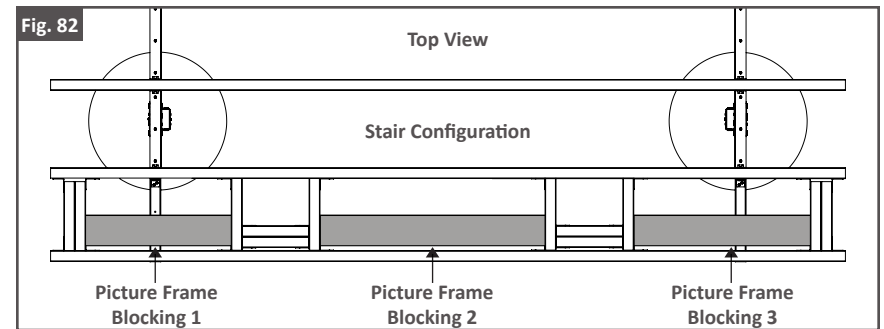
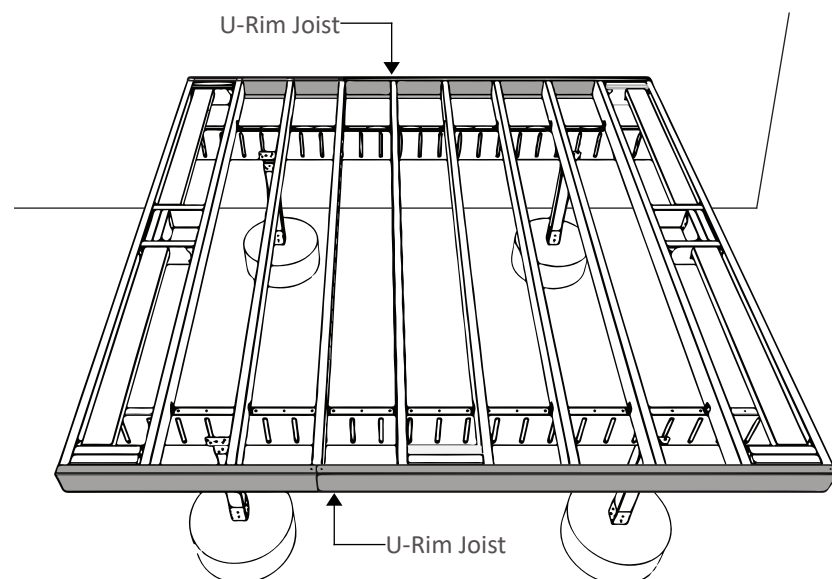


Fig. 82





## INSTALLATION: RIM JOIST



### Step 1: Mount U-Rim Joists

1. Mount Blank U-Rim Joist onto ends of mounted Joists. As shown in Fig. 83.
2. Using Evolution Self-drilling Screws, fasten on top and bottom faces of the Blank U-Rim Joist. As shown in Fig. 84. Be sure end of U-Rim Joist is flush with outside face of End joist.
3. Measure opening between end of mounted U-Rim Joist and outside face of opposite End Joist. As shown in Fig. 85.
4. Cut second U-Rim Joist to measured length.
5. Mount second Blank U-Rim Joist onto ends of Joists.
6. Using Evolution Self-drilling Screws, fasten on top and bottom faces of the Blank U-Rim Joist. As shown in Fig. 86. Be sure end of U-Rim Joist is flush with outside face of End joist.

### Note:

- Reference cutting & painting instructions on pages 65 - 67.

Fig. 83

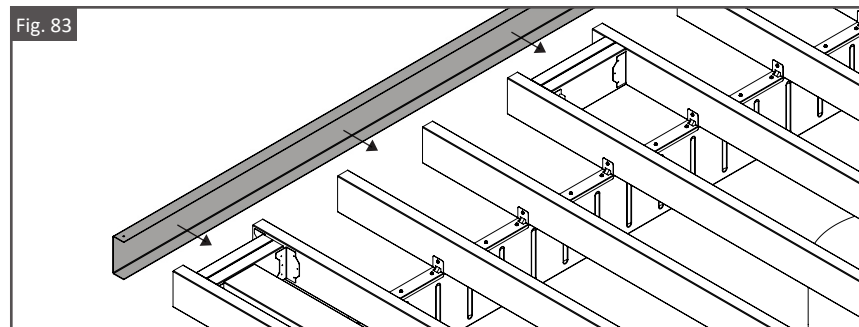


Fig. 84

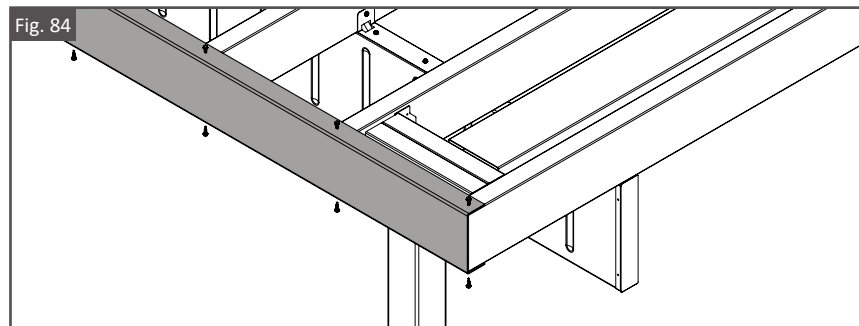


Fig. 85

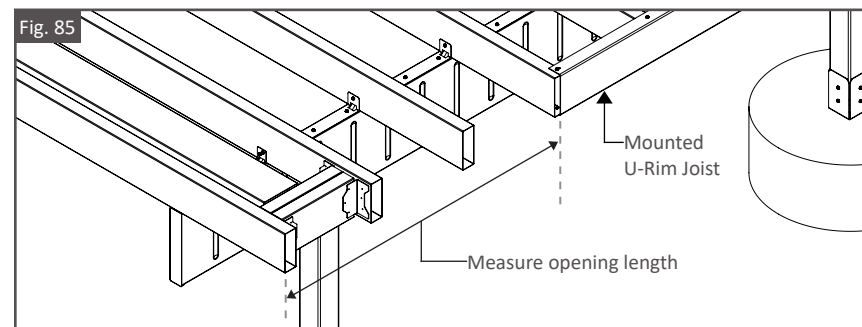
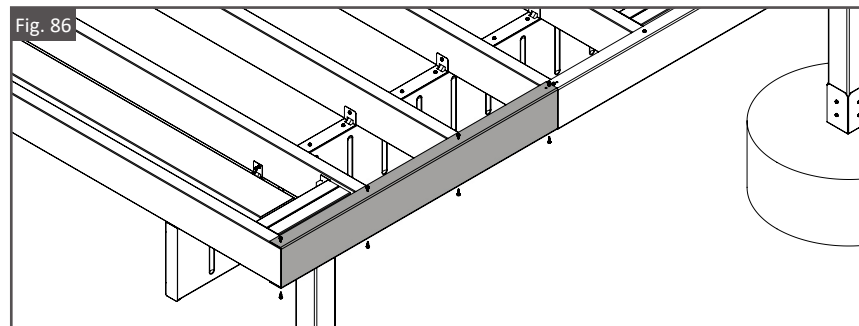
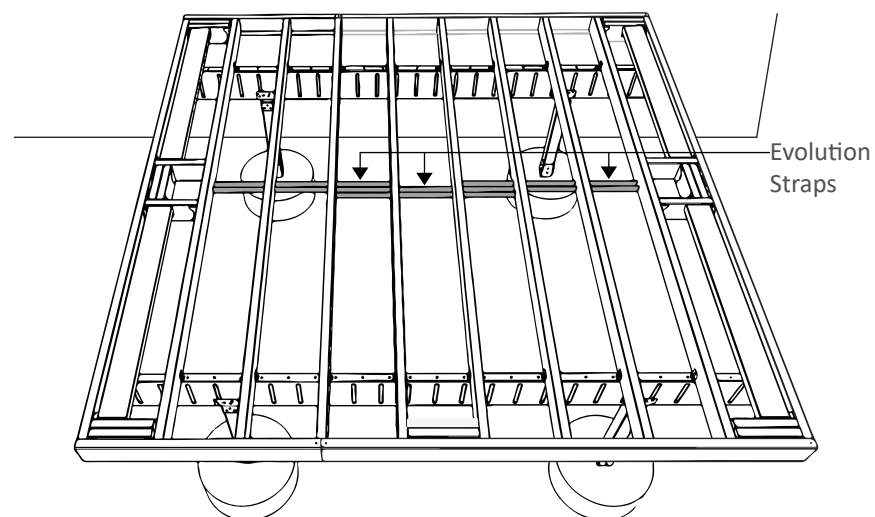


Fig. 86



## INSTALLATION: EVOLUTION STRAP

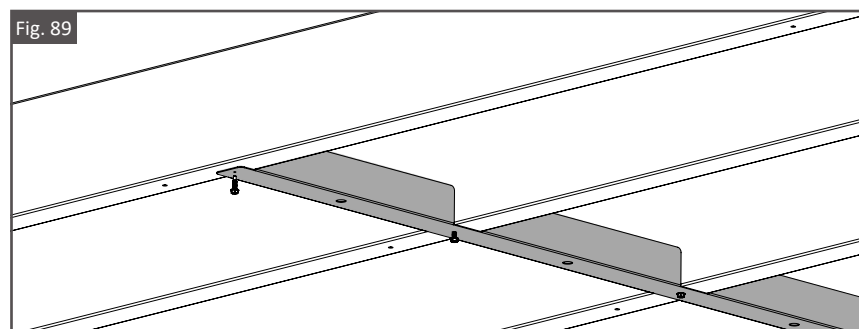
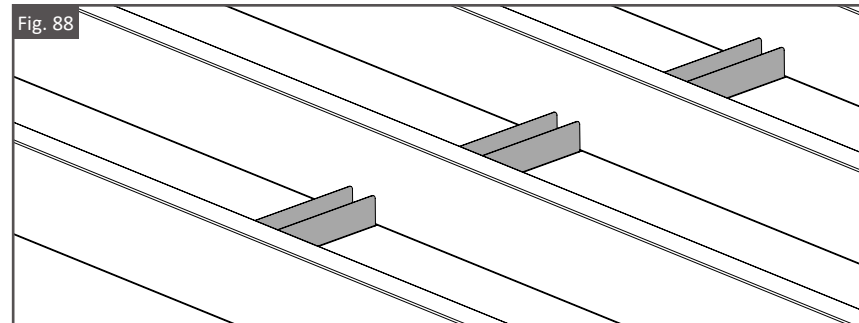
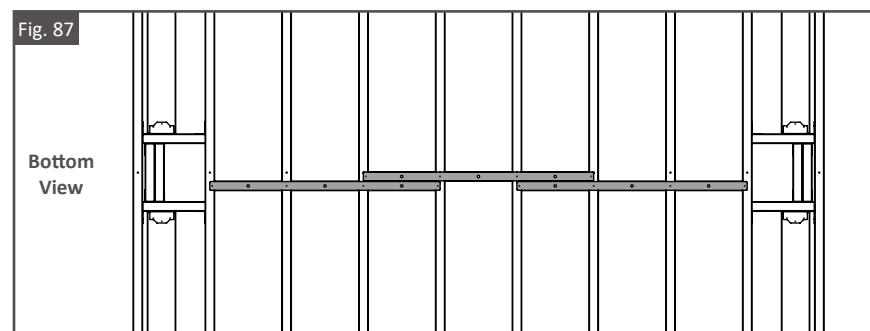


### Step 1: Mount Evolution Straps onto Infill Joists

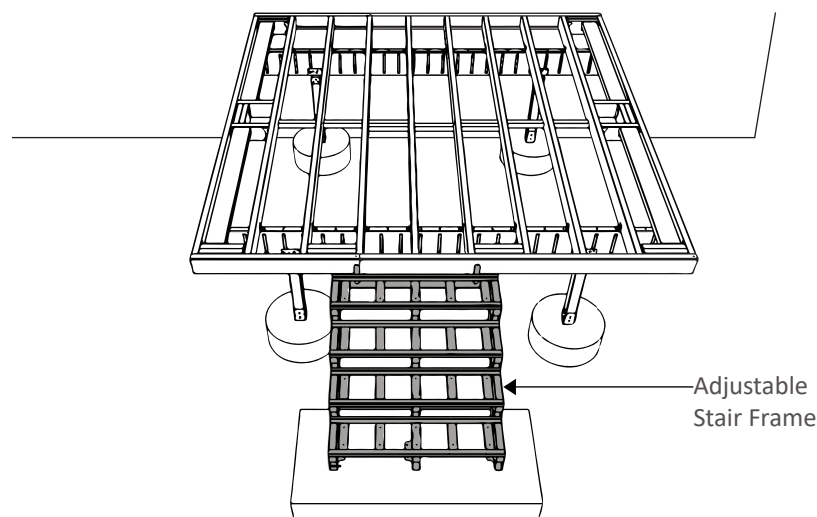
1. Place three Evolution Straps onto the underside of the Infill Joists. As shown in Fig. 87 & 89. Fasten straps to joists using Evolution Self-drilling Screws. As shown in Fig. 89.

#### Note:

- The Evolution Strap is 4' [1219mm] long.



## INSTALLATION: STAIR KIT (OPTIONAL)



### Step 1: Calculate Required Stair Measurements

1. Reference link below for the Fortress Stair Calculator.  
<https://fortressbp.com/framing/stair-calculator>
2. **Determine Configuration:** On the Fortress Stair Calculator page, begin by selecting the desired configuration. The deck and stair kit framing is designed to use the “Drop to Grade” configuration. As shown in Fig. 90.
3. **Determine Rise:** Measure rise (height) from the top of the deck board to the landing (ground) surface. If the decking is not already installed, measure from the top face of framing to landing (ground) surface and add 1” [25mm] to the measurement to account for deck board thickness. As shown in Fig. 91.
4. Input measured rise into the stair calculator “Rise and Tread: Total Rise” section. As shown in Fig. 92.
5. **Determine Tread Depth:** For Apex or Infinity decking boards, your Tread Depth should be 11-1/8” [283mm] (Board width x2 plus 1/8” [3mm] to account for gapping). As shown in Fig. 93.
6. Input determined tread Depth (11.125) into the stair calculator “Rise and Tread: Tread Depth” section. As shown in Fig. 94.

7. **Determine Tread Thickness:** For Apex or Infinity decking boards, your Tread/board thickness should be 1” [25mm].
8. Input determined tread thickness (1” [25mm]) into the stair calculator “Rise and Tread: Tread Thickness” section. As shown in Fig. 95.
9. **Determine Tray & Stringer:** In the “Tray and Stringer: Tray” section, select “No Tray”. In the “Tray and Stringer: Stringer” section, select “Evolution 2” x 6” Joist as Stringer”. As shown in Fig. 96.
10. **Determine Step Configuration:** In the “Select a Step Configuration” section, select the drop down list then select the desired number of steps and total run. As shown in Fig. 97. Select step configuration option that works with number of Stair Trays provided in stair kit.
11. The Total Run should be able to fit onto concrete footing or slab with a **minimum** of 10” [254mm] spacing from front of final step to front edge of footing, or slab. As shown in Fig. 98 & 99. Adjust total run selection as needed.
12. Once step configuration is selected, the Fortress Stair Calculator will provide the results with required measurements. As shown in Fig. 100. These measurements will be referenced to assembly the Adjustable Stair Frame.

Fig. 90

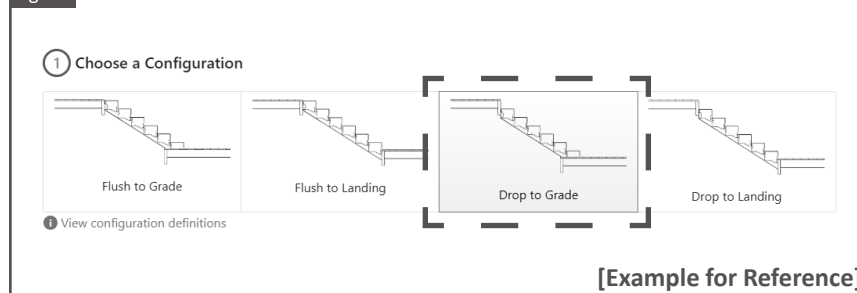


Fig. 91

Side View

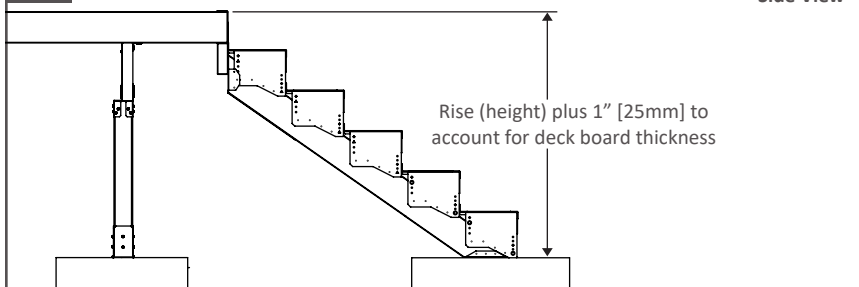


Fig. 92

## ② Rise and Tread

## ③ Tray and Stringer

Total Rise: ①  
4 ft 1.12 in

Tread Depth: ①  
11.12 in

Tread Thickness:  
1 in

Tray:  
☐ Fortress Evolution Tray  
☒ No Tray

Stringer:  
☒ Evolution 2" x 6" Joist as Stringer  
☐ Evolution 2" x 11" Beam as Stringer

[Example for Reference]

Fig. 93

Side View

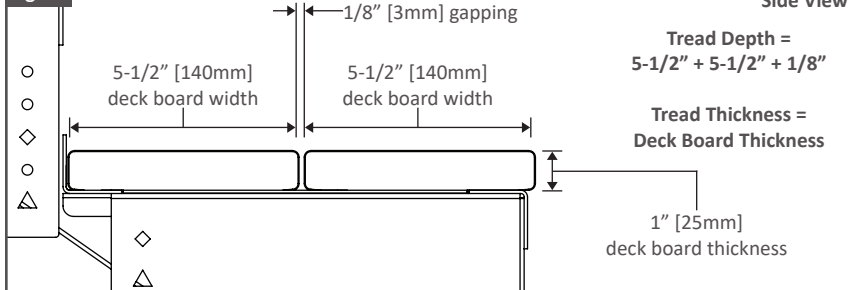


Fig. 94

## ② Rise and Tread

## ③ Tray and Stringer

Total Rise: ①  
4 ft 1.12 in

Tread Depth: ①  
11.12 in

Tread Thickness:  
1 in

Tray:  
☐ Fortress Evolution Tray  
☒ No Tray

Stringer:  
☒ Evolution 2" x 6" Joist as Stringer  
☐ Evolution 2" x 11" Beam as Stringer

[Example for Reference]

Fig. 95

## ② Rise and Tread

## ③ Tray and Stringer

Total Rise: ①  
4 ft 1.12 in

Tread Depth: ①  
11.12 in

Tread Thickness:  
1 in

Tray:  
☐ Fortress Evolution Tray  
☒ No Tray

Stringer:  
☒ Evolution 2" x 6" Joist as Stringer  
☐ Evolution 2" x 11" Beam as Stringer

[Example for Reference]

Fig. 96

## ② Rise and Tread

## ③ Tray and Stringer

Total Rise: ①  
4 ft 1.12 in

Tread Depth: ①  
11.12 in

Tread Thickness:  
1 in

Tray:  
☐ Fortress Evolution Tray  
☒ No Tray

Stringer:  
☒ Evolution 2" x 6" Joist as Stringer  
☐ Evolution 2" x 11" Beam as Stringer

[Example for Reference]

Fig. 97

## ③ Tray and Stringer

## ④ Select a Step Configuration

- Tray:  
☐ Fortress Evolution Tray  
☒ No Tray
- Stringer:  
☒ Evolution 2" x 6" Joist as Stringer  
☐ Evolution 2" x 11" Beam as Stringer

9 step options are available for the values provided. Select an option below to view the results.

Please Select...

Please Select...

6 Steps - 65 29/32" Total Run

6 Steps - 59 20/32" Total Run

7 Steps - 69 24/32" Total Run

7 Steps - 74 8/32" Total Run

8 Steps - 79 25/32" Total Run

8 Steps - 84 12/32" Total Run

9 Steps - 97 26/32" Total Run

9 Steps - 90 12/32" Total Run

9 Steps - 96 23/32" Total Run

[Example for Reference]

Fig. 98

Side View

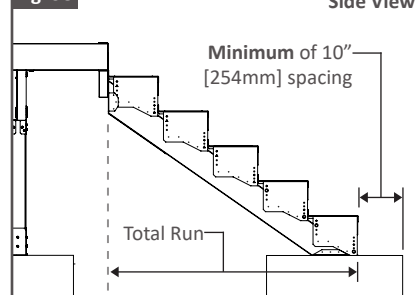
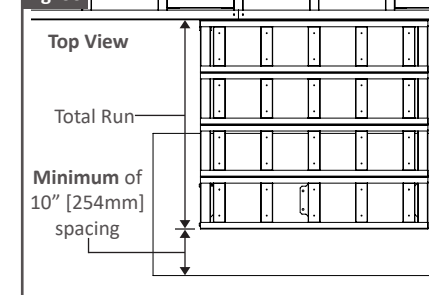
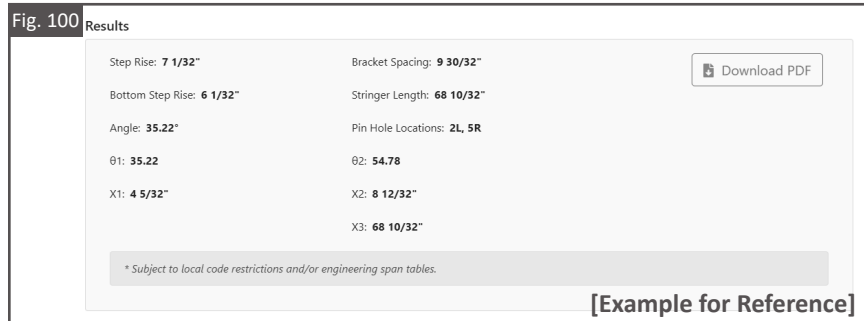


Fig. 99

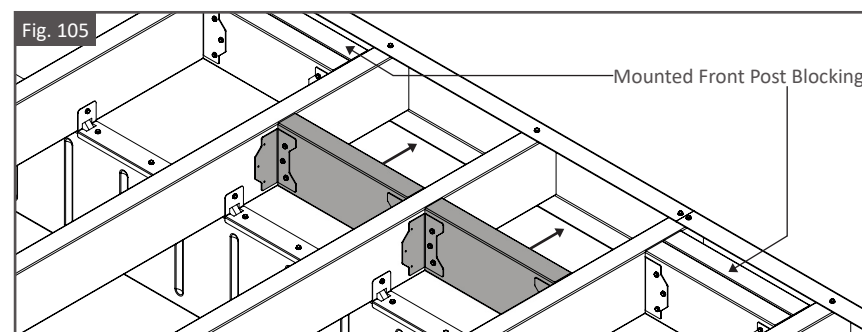
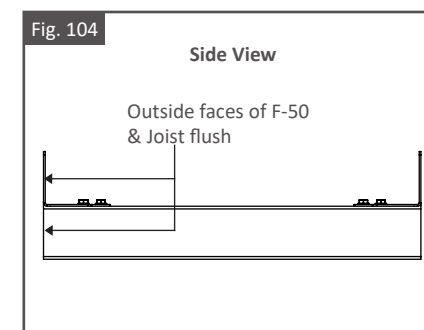
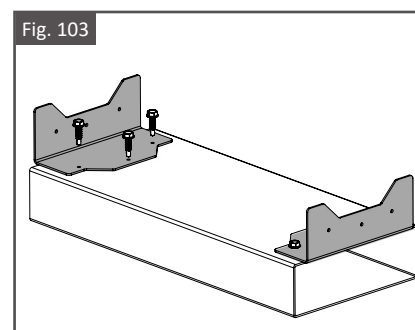
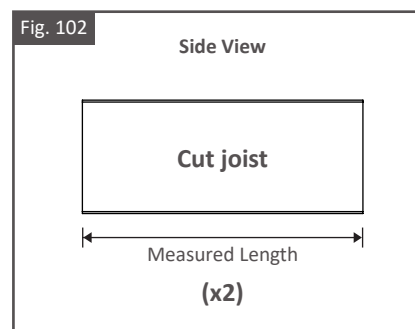
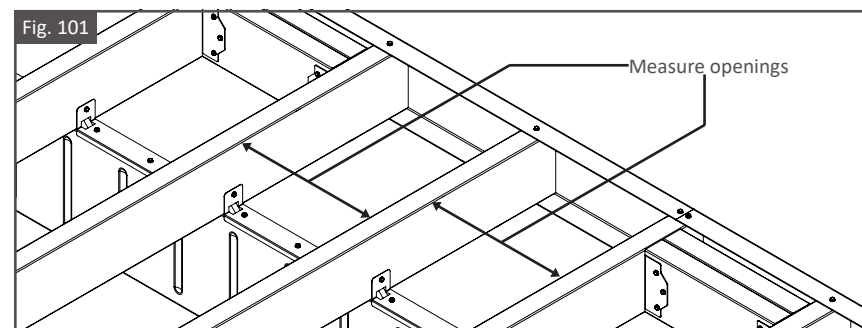
Top View

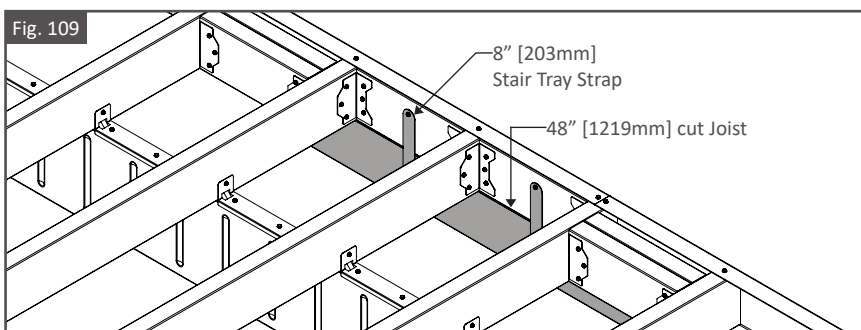
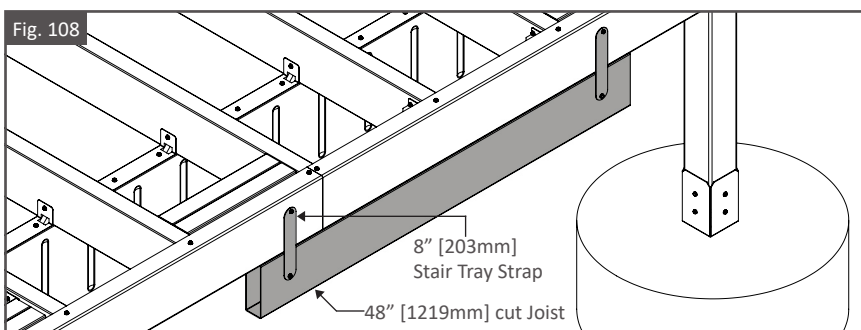
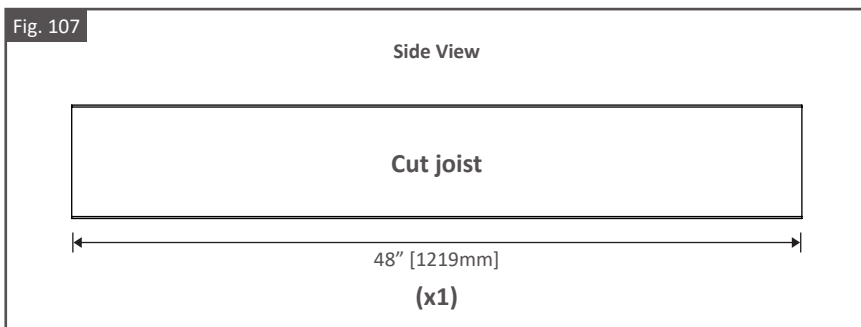
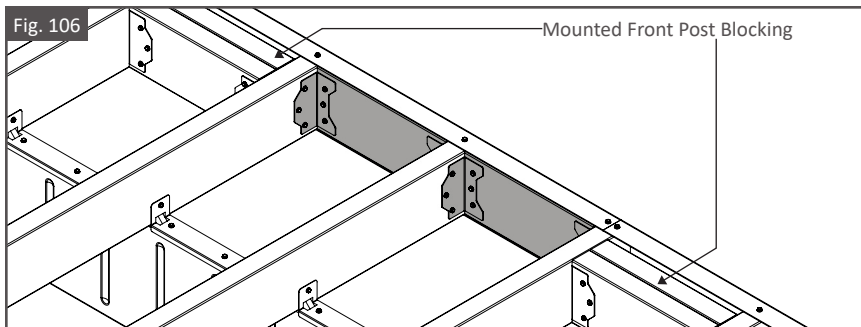




## Step 2: Mount Stair Blocking (Front Post mounting)

- **This step is for front post blocking installation. For side post blocking instructions, reference step 3 on pages 51.**
1. Measure opening between Infill Joists. As shown in Fig. 101.
  2. Cut two Joists to measured lengths. As shown in Fig. 102.
  3. Using Evolution Self-Drilling Screws, Mount two F-50 Brackets onto opposite ends of the cut Joist cuts. Be sure the outside edge of the F-50 Brackets and edge of the joist are flush. As shown in Fig. 103 & 104.
  4. Insert the two cut Joist assemblies into openings in inside face of U-Rim between the two mounted Front Post Blocking. As shown in Fig. 105.
  5. Using Evolution Self-Drilling Screws, fasten the cut Joist assemblies onto the Infill joists. As shown in Fig. 106.
  6. Cut one Joist to 48" [1219mm] length. As shown in Fig. 107.
  7. Position cut Joist flush with bottom face of U-Rim and centered between the two Front Post Blocking.
  8. Using Evolution Self-Drilling Screws and two 8" [203mm] Straps, fasten the cut Joist onto the outside face of the U-Rim. Be sure straps are positioned 3" [76mm] from each edge of the cut Joist. As shown in Fig. 108.
  9. Using Evolution Self-Drilling Screws and two 8" [203mm] Straps, fasten the cut Joist onto the two previously mounted cut Joists on the inside face of the U-rim. Be sure straps are centered vertically between each cut Joist. As shown in Fig. 109.
  10. Mount Joist caps onto exposed ends of the 48" [1219mm] cut Joist. Reference Beam cap installation instructions on page 18.



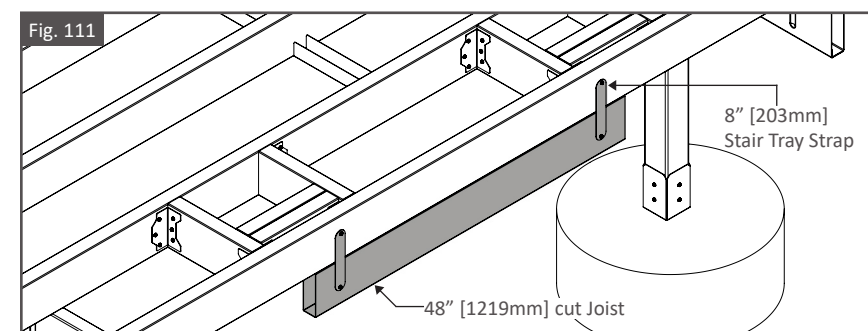
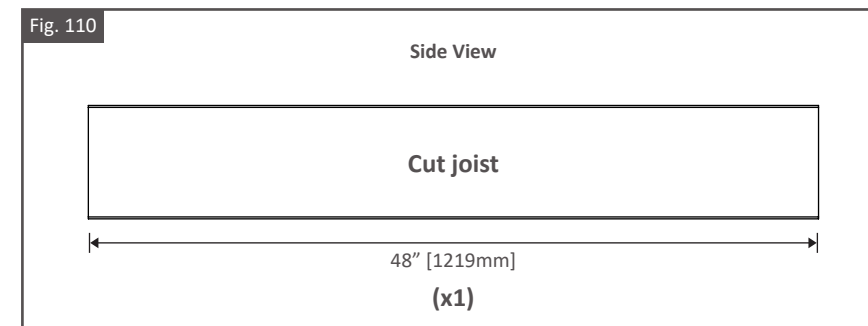


### Step 3: Mount Stair Blocking (Side Post Mounting)

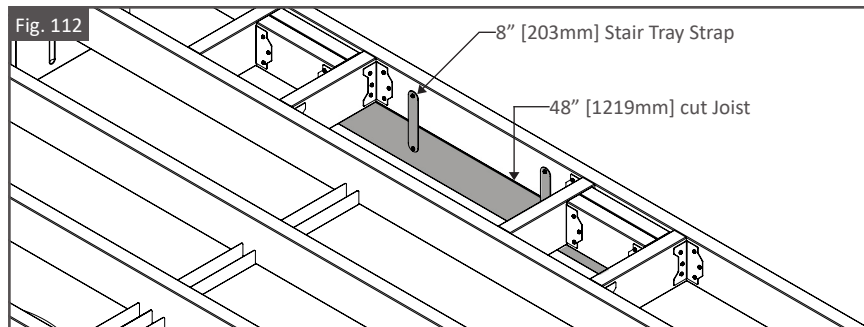
1. Cut one Joist to 48" [1219mm] length. As shown in Fig. 110.
2. Position cut Joist flush with bottom face of the End Joist and centered between the two Side Post Blocking.
3. Using Evolution Self-Drilling Screws and two 8" [203mm] Straps, fasten the cut Joist onto the End Joist. Be sure straps are positioned 3" [76mm] from each edge of the cut Joist. As shown in Fig. 111.
4. Using Evolution Self-Drilling Screws and two 8" [203mm] Stair Tray Straps, fasten the cut Joist onto the inside face of the End Joist. Be sure straps are positioned evenly between the Side Post Blocking and are centered vertically between each cut Joist. As shown in Fig. 112.
5. Mount Joist caps onto exposed ends of the 48" [1219mm] cut Joist. Reference Beam cap installation instructions on page 18.

#### Note:

- Reference cutting & painting instructions on pages 65 - 67.





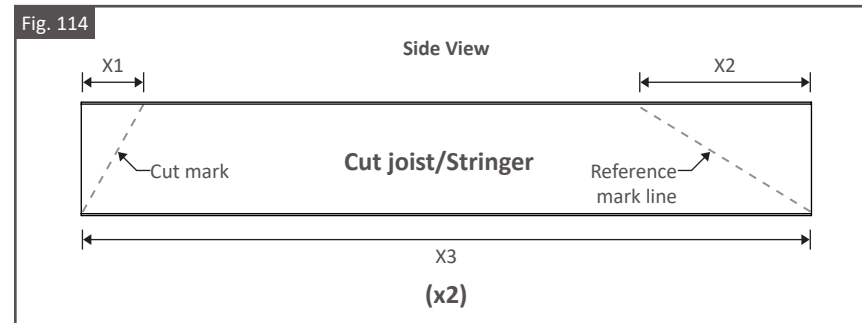
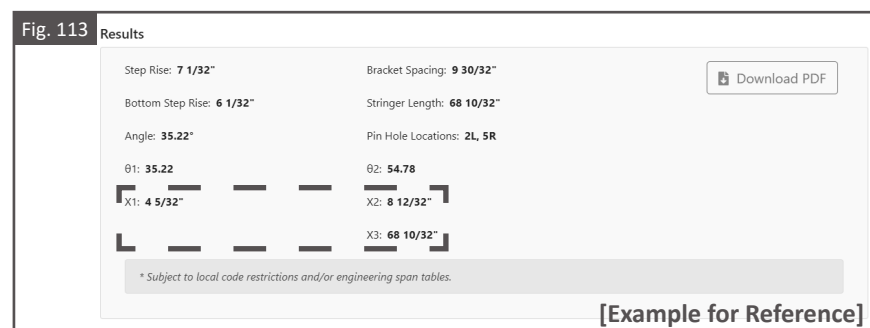


#### Step 4: Cut Stair Stringers (Joists) to Length

1. Reference X1, X2 and X3 measurements in stair calculator. As shown in Fig. 113 & 114.
2. Cut Joist to X3 length.
3. Using a straight edge, measure and mark X1 distance onto the cut Joist.
4. Cut Joist at X1 cut mark.
5. Using a straight edge, measure and mark X2 distance onto the cut Joist.
6. **DO NOT** cut the X2 mark line during this step. X2 will be cut during a later step.

#### Note:

- Reference cutting & painting instructions on pages 65 - 67.
- **Fig. 113 is taken from Stair Calculator results.**
- X1 end of Joist is mounted onto deck framing. X2 end of Joist is mounted onto landing (ground) surface.



#### Step 5: Determine Pin Hole Locations for Stair Brackets

1. Reference Pin Hole Locations in stair calculator. As shown in Fig. 115.
2. Insert two pins into a bracket at the defined hole locations. As shown in Fig. 116 & 117.

#### Note:

- **Fig. 115 is taken from Stair Calculator results.**
- The pins will hold the bracket at the correct angle until it is fastened securely to the stringer. **Once the bracket is fastened the pins should be removed and discarded.**

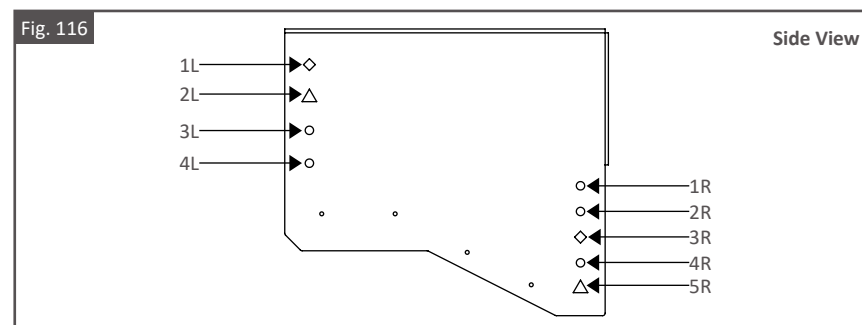
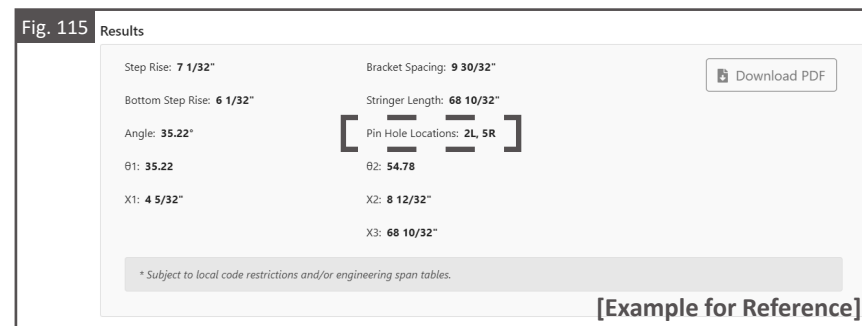
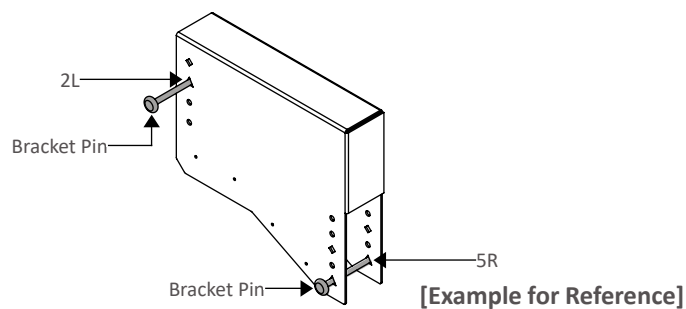


Fig. 117



### Step 6: Mount Adjustable Stair Brackets onto Stair Stringers

1. Insert bracket pins into the first bracket. Reference step 5 on pages 53 & 54 for pin hole locations.
2. Reference bracket spacing measurement in stair calculator. As shown in Fig. 118.
3. Position bracket onto stringer along cut end
4. Measure bracket spacing from cut end of joist to back end of bracket. As shown in Fig. 119 & 120.
5. Clamp bracket onto stringer then fasten **single face of bracket** using Using Evolution Self-Drilling Screw. As shown in Fig. 121.
6. Remove pins once bracket is fastened.
7. Insert bracket pins into the second bracket. Reference step 5 on pages 53 & 54 for pin hole locations.
8. Position bracket onto stringer in line with first bracket.
9. Measure bracket spacing from back face of first bracket to back edge of second bracket. As shown in Fig. 122 & 123.
10. Clamp bracket onto stringer then fasten **single face of bracket** using Using Evolution Self-Drilling Screw. As shown in Fig. 124.
11. Remove pins once bracket is fastened.
12. Repeat steps (step 6: 7 - 11) for remaining brackets in stringer. As shown in Fig. 125. **DO NOT** mount final bracket.
13. Insert bracket pins into the final bracket. Reference step 5 on pages 53 & 54 for pin hole locations.
14. Position final bracket onto stringer in line with previous bracket.
15. Mount a scrap piece of joist at the uncut end of the stringer as support for bottom pin hole in final bracket.

16. Using a straight edge, extend X2 cut mark (Fig. 114) onto face of final bracket. As shown in Fig. 126.
17. Clamp final bracket onto stringer then fasten **single face of bracket** using Using Evolution Self-Drilling Screw. As shown in Fig. 127. Be sure screws are above cut line and fasten into both bracket and stringer. Screws in final bracket **DO NOT** insert into pre-drilled holes, new hole will need to be created.
18. Cut Final bracket and stringer along X2 cut mark. As shown in Fig. 128 & 129.
19. Using Evolution Self-Drilling Screws, fasten second side of all brackets.

### Note:

- Be sure all brackets are initially **ONLY** fastened on same single face before cutting stringers at X2 cut mark. This will allow for easier stringer cutting. Fasten second face of all brackets after stringers are cut.
- **Fig. 118 is taken from Stair Calculator results.**
- Reference cutting & painting instructions on pages 65 - 67.

Fig. 118

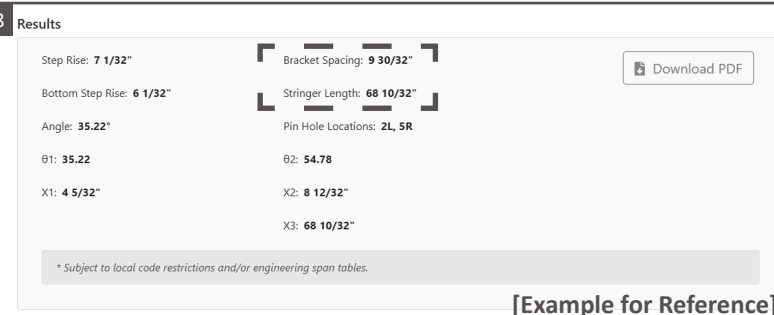


Fig. 119

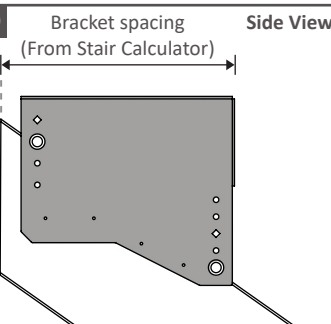
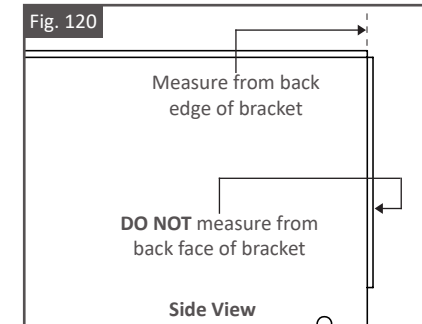
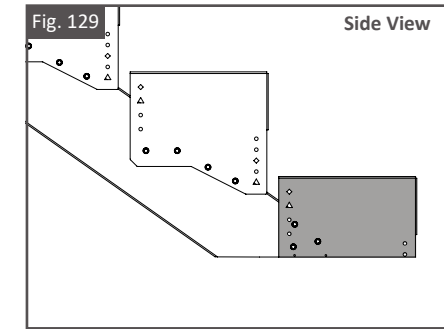
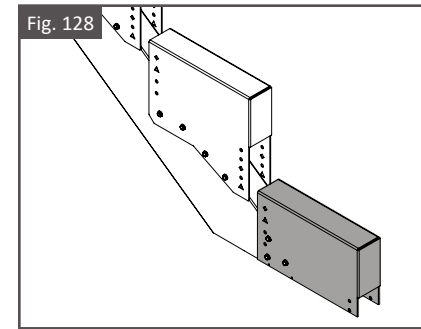
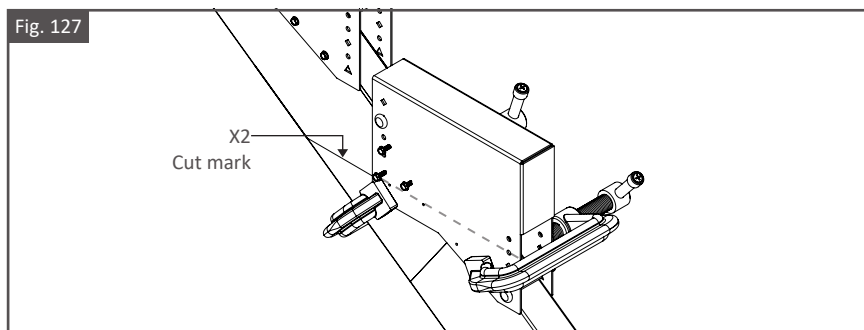
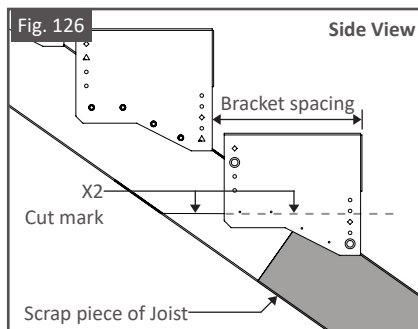
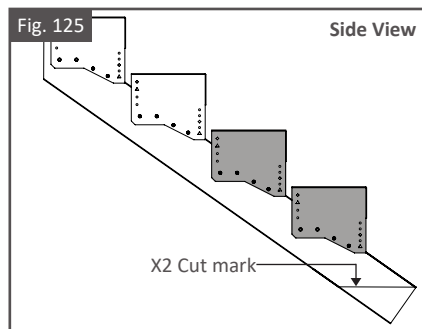
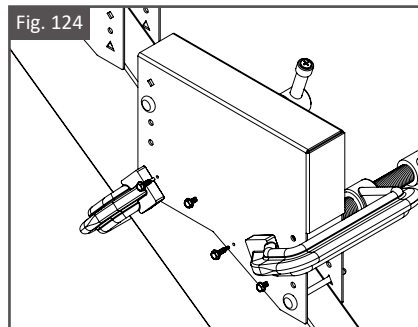
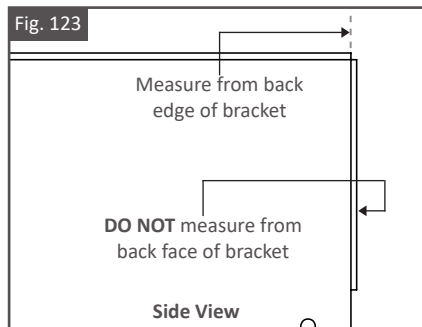
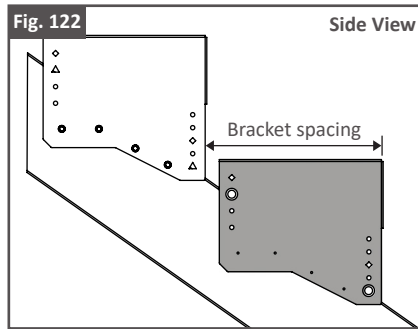
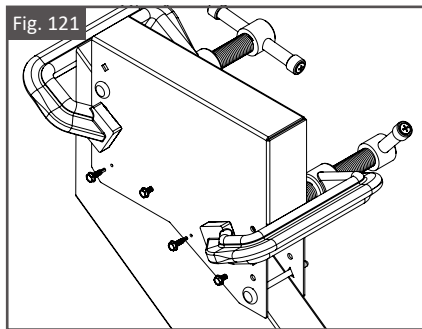


Fig. 120





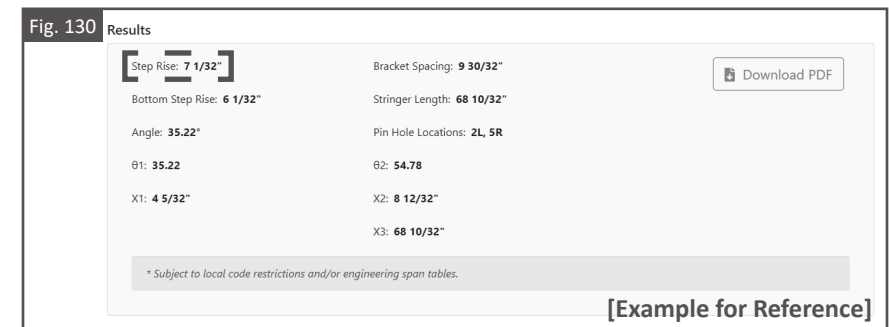


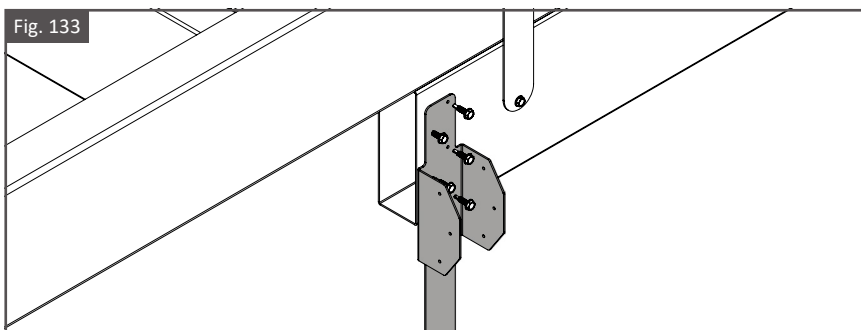
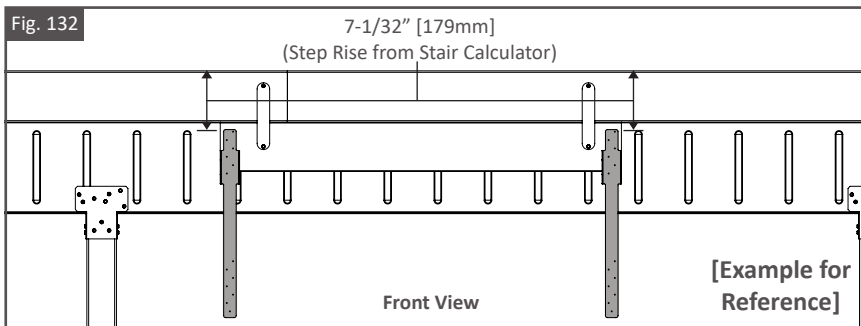
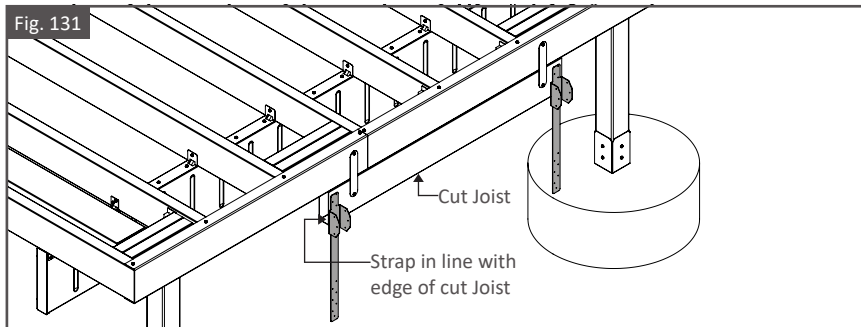
### Step 7: Mount Stair Straps

1. Reference Step Rise measurement in stair calculator. As shown in Fig. 130.
2. Position each Stair Strap in line with an edge of the cut Joist. As shown in Fig. 131.
3. Position each Stair Strap with spacing from top face of framing set at Step Rise measurement. As shown in Fig. 132.
4. Confirm straps are level before fastening. Adjust if needed.
5. Using Evolution Self-Drilling Screws, fasten Stair Straps onto framing. As shown in Fig. 133.

### Note:

- **Fig. 130 is taken from Stair Calculator results.**
- Not all screw holes in Stair Straps will be filled and used when fastening straps onto cut Joist.





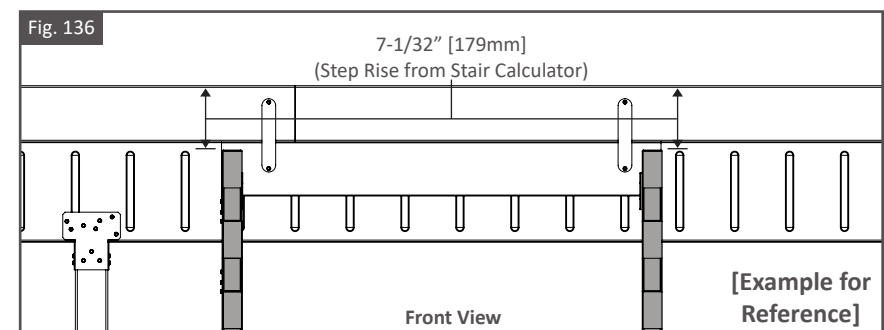
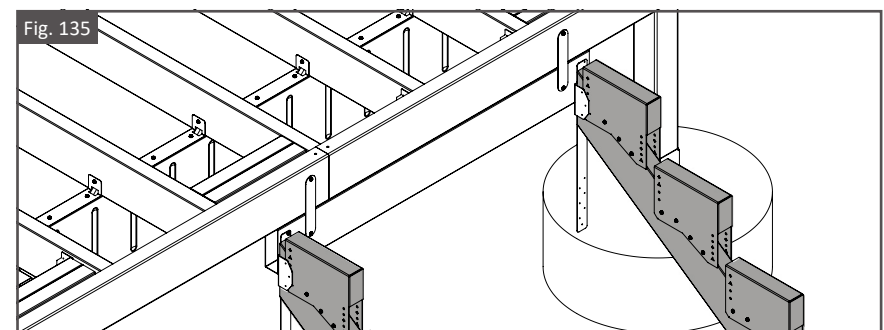
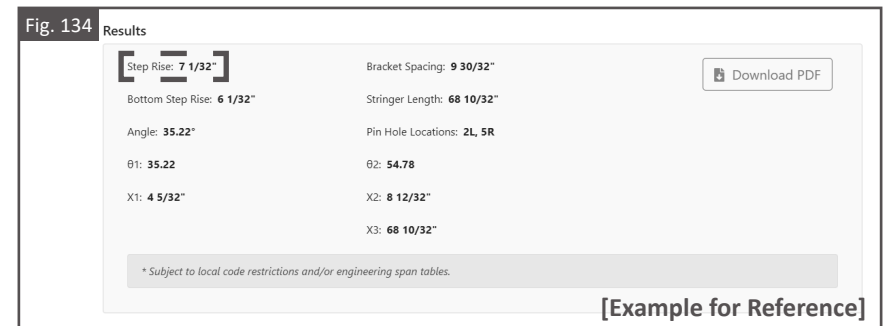
### Step 8: Mount Stair Stringers onto Stair Straps

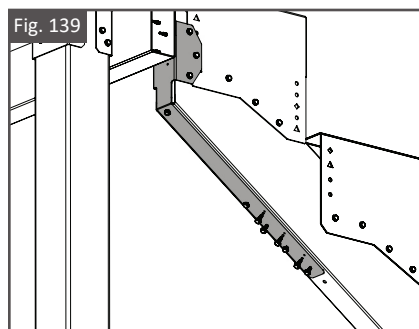
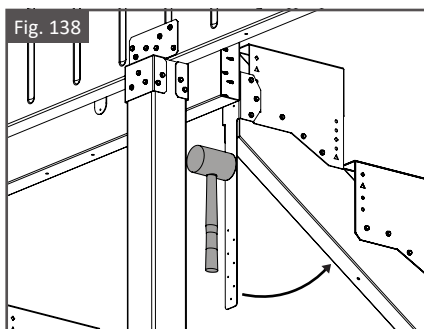
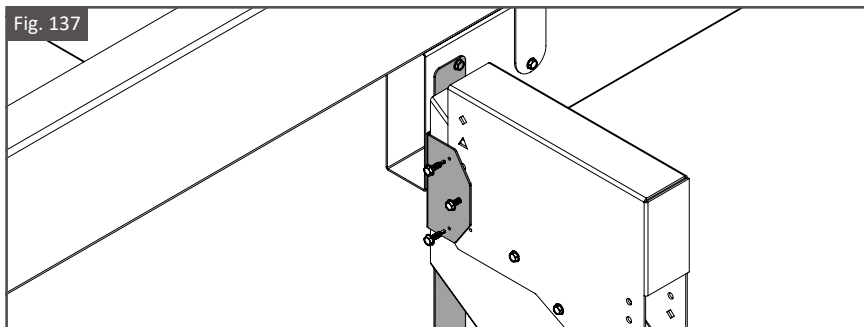
1. Reference Step Rise measurement in stair calculator. As shown in Fig. 134.
2. Position X1 cut mark end (Fig. 114) of Stair Stringer assemblies into Stair Straps and spacing from top face of framing set at Step Rise measurement. As shown in Fig. 135 & 136.
3. Confirm stringers are level before fastening. Adjust if needed.
4. Using Evolution Self-Drilling Screws, fasten Stair Stringer assemblies onto Stair Straps. As shown in Fig. 137.

5. Using a Rubber Mallet, fold tails of Stair Straps onto bottom face of Stair Stringer assemblies. As shown in Fig. 138.
6. Using Evolution Self-Drilling Screws, fasten tail of Stair Straps on to bottom face of Stair Stringer assemblies. As shown in Fig. 139. A screw can be added at bend point to help mount Stair Straps flush onto stringers.

### Note:

- Fig. 134 is taken from Stair Calculator results.



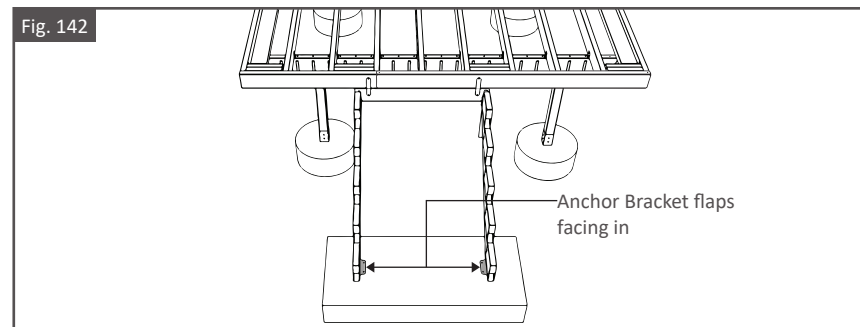
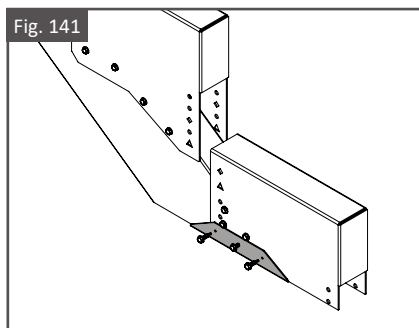
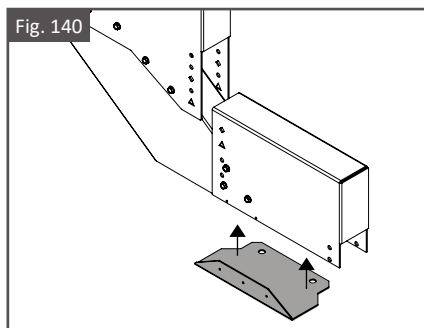


### Step 8: Mount Stair Anchor Bracket onto Stair Stringers

1. Position a Stair Anchor Bracket on bottom of each Stair Stringer assembly. As shown in Fig. 140.
2. Using Evolution Self-Drilling Screws, fasten brackets onto each stringer assembly. As shown in Fig. 141.
3. Be sure flaps on anchor brackets face in. As shown in Fig. 142. Adjust if needed.

#### Tip:

- **DO NOT** fasten anchor brackets onto foundation in this step.



### Step 9: Mount Adjustable Stair Trays & Stair Anchor Brackets

1. Using a Rubber Mallet and a block of wood, hammer the bottom lip of the Adjustable Stair Tray until fully extended. As shown in Fig. 143. Be sure the two ends of the stair tray **DO NOT** become disengage once extended.
2. Position the Adjustable Stair Tray onto second step of mounted Stair Stringers. As shown in Fig. 144.
3. Position the top lip of the stair tray flush to the back and outside faces of the top Stair Bracket and the top and outside faces of the bottom Stair Bracket.
4. Using Evolution Self-Drilling Screws, fasten the top lip of the stair tray onto the top face of the bottom Stair Brackets. As shown in Fig. 145. **Deck board screws will be installed with a 1-3/16" [30mm] spacing from each edge of the deck board. Position Evolution Self-Drilling Screws appropriately to allow for deck board screws to be successfully fastened.**
5. Using a Rubber Mallet and a block of wood, hammer the back of the bottom lip of the stair tray until flush with the back face of the bottom Stair Brackets. As shown in Fig. 146 & 147.
6. Using Evolution Self-Drilling Screws, fasten the bottom lip of the stair tray onto the top face of the bottom Stair Brackets. As shown in Fig. 148.
7. Pre-drill concrete, then use 3/8" x 3" [10mm x 76mm] Concrete Anchor Bolts to fasten Stair Anchor Brackets onto concrete footing surface. As shown in Fig. 149.
8. Repeat Adjustable Stair Tray mounting steps (step 9: 1 - 6) for remaining stairs on Stair Stringers. As shown in Fig. 150.

**Tip:**

- Be sure the top and bottom lips of the Adjustable Stair Tray are fastened onto to each stair stringer contact point. Use 4 screws per Adjustable Stair Tray.

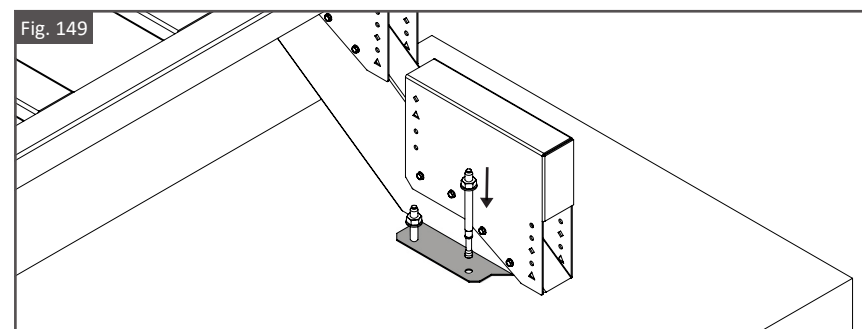
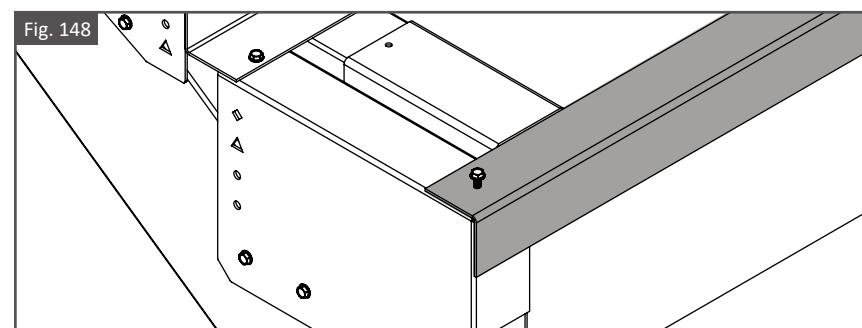
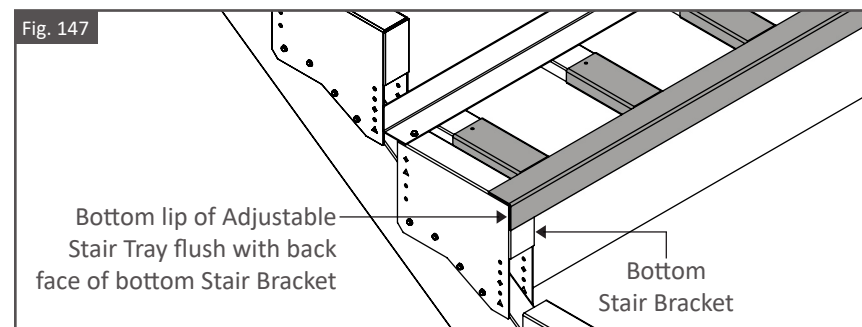
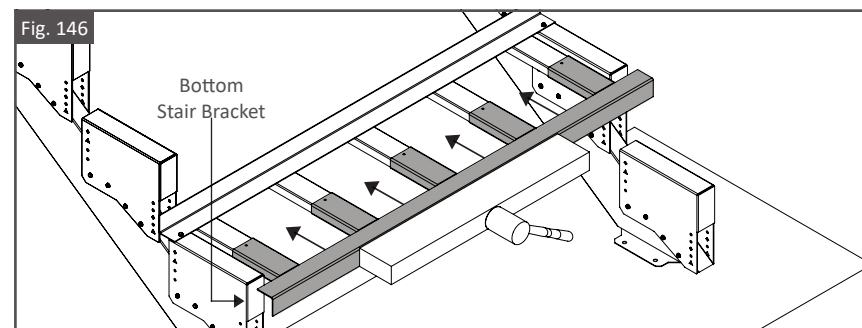
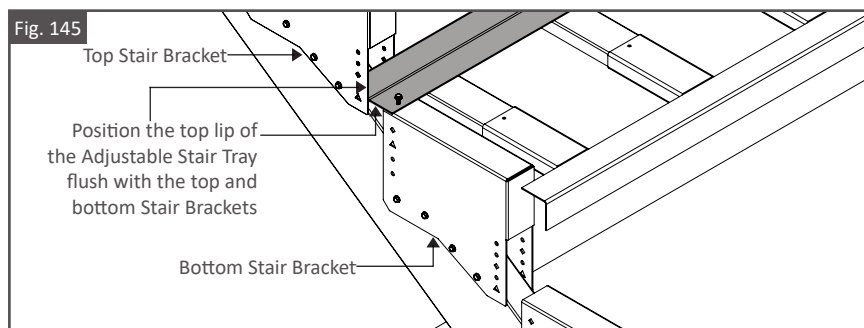
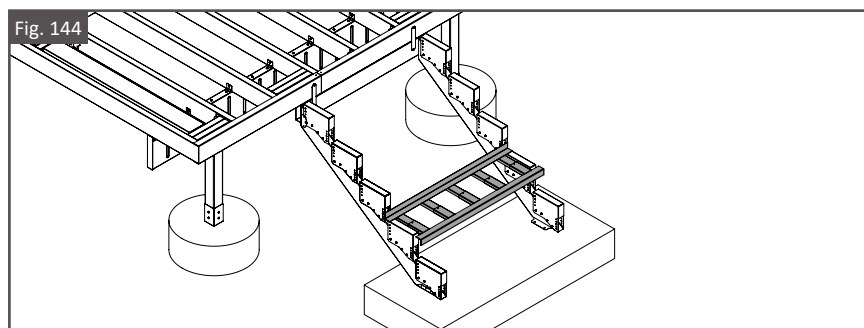
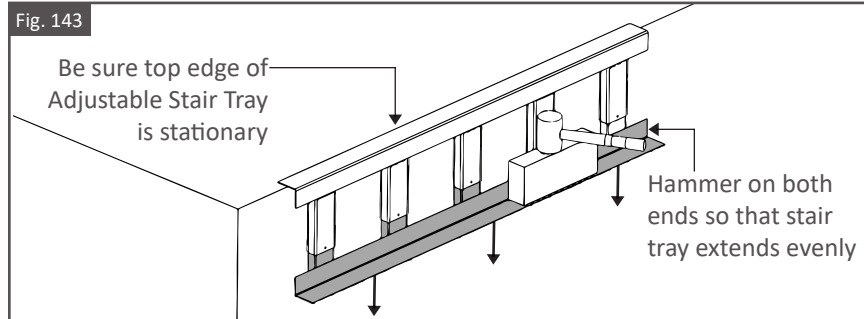
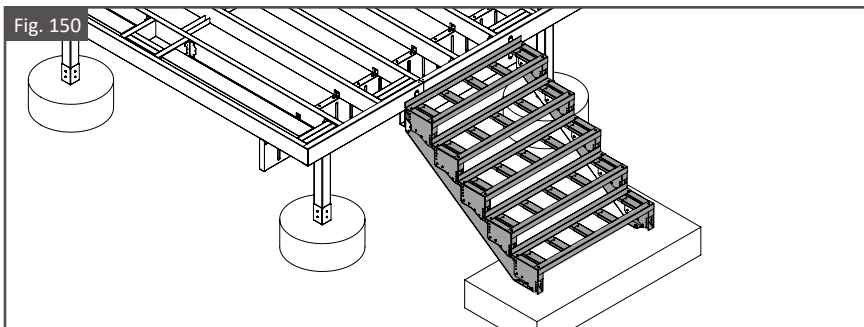


Fig. 150



## CUTTING & PAINTING

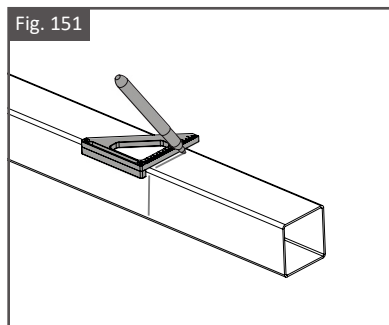
### Step 1: Mark Cut Points

1. Position the material to be cut on a flat surface, preferably Saw Horses.
2. Using a pencil, mark desired cut length onto material.
3. Using a speed square, straighten cut point markings on top and side faces. As shown in Fig. 151.

#### Tip:

- Before making cuts, confirm cut length is correct.

Fig. 151



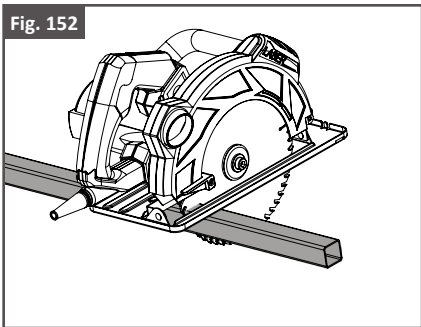
### Step 2: Cut Material To Length

1. Cut the material using a metal cutting circular saw or grinder with a cutoff disc. As shown in Fig. 152. Be sure to follow cut marks on top and side faces.

#### Tip:

- **Be sure to use a saw and blade designed to cut metal. Metal cutting saws rotate a lower RPM. Using a standard wood saw will lead to premature wearing of the blade.**
- Be sure to support product to prevent bending during cutting.
- Be sure to not over heat the material when making cuts with a grinder.

Fig. 152



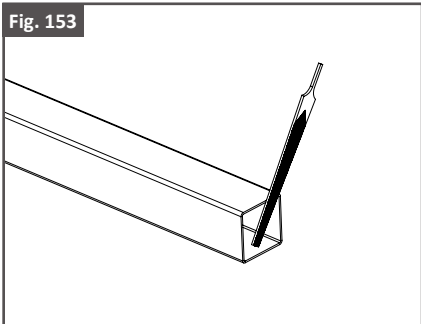
### Step 3: Clean Cut Areas

1. Use a file to smooth cut edges. As shown in Fig. 153.
2. Remove any metal shavings and dust with a brush or rag.
3. Make sure surfaces to be painted are clean. **DO NOT** cut product over concrete. Be sure to remove any metal shavings to avoid stains.

#### Tip:

- **DO NOT** allow metal shavings and/or chips to get dropped or blown into a pool, hot tub, or any other body of water.
- **Be sure to remove metal shavings and/or chips from inside the cut material. Not doing so may result in rust and staining of ground surfaces after installation.**

Fig. 153



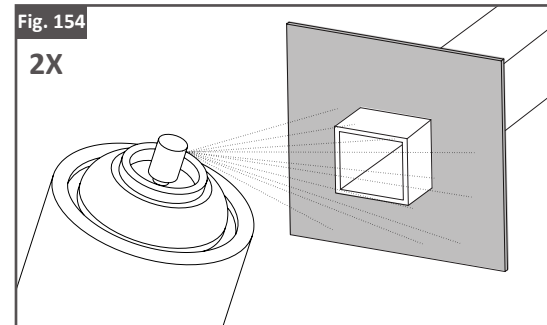
### Step 4: Apply Spray Paint To Cut Areas

1. Using a piece of cardboard as a mask, apply the 1<sup>st</sup> coat of Fortress zinc based touch-up paint.
2. Allow to dry before applying second coat.
3. Apply the 2<sup>nd</sup> coat of Fortress zinc based touch-up paint.
4. Allow to dry and install.

#### Tip:

- Apply 2 coats of spray paint in non-salt water environments and 3 coats in salt-water environments.

Fig. 154



## CARE & MAINTENANCE

### Care And Maintenance Of Fortress Building Products Powder-Coated Products And Surfaces:

- Immediately after installation of your Fortress Building Products, clean powder-coated products and surfaces with a solution of warm water and non-abrasive, pH neutral detergent solution. Surfaces should be thoroughly rinsed after cleaning to remove all residues. All surfaces should be cleaned using a soft cloth or sponge.
- Ensure construction materials such as concrete, plaster, and paint splashes are removed immediately before they have a chance to dry. Failure to remove these materials may cause damage to the powder-coated surfaces.
- **DO NOT** allow metal shavings and/or chips to get dropped or blown into a pool, hot tub, or any other body of water. Staining could occur if this were to happen.
- The frequency of cleaning depends in part on the standard of appearance and also the requirements to remove deposits that may cause damage to the powder coating after prolonged exposure. Fortress recommends cleaning in three to four monthly intervals.
- **WARNING: Do not use strong solvents such as thinners, or solutions containing chlorinated hydrocarbons, esters, or ketones. Abrasive cleaners or cutting compounds should not be used.**

## WARRANTY

To obtain and review a copy of the warranty, please go to: <https://Fortressbp.com/warranties>. You can also contact: (844) 909-1999 or write to: Fortress Building Products Warranty, 1720 N 1st St, Garland, TX 75040 to obtain a copy of the warranty.

### Note:

- On the fortress website there are two warranties for framing - standard warranty and salt water proximity warranty. Be sure to reference the appropriate warranty.



**JOIN THE REVOLUTION.**

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DECK & STAIR KIT INSTALLATION: FREE-STANDING EVOLUTION FRAMING

8/2022